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PRODUCTION -- MANAGEMENT

APRIL 12, 1934

PROCESSES -- NEWS

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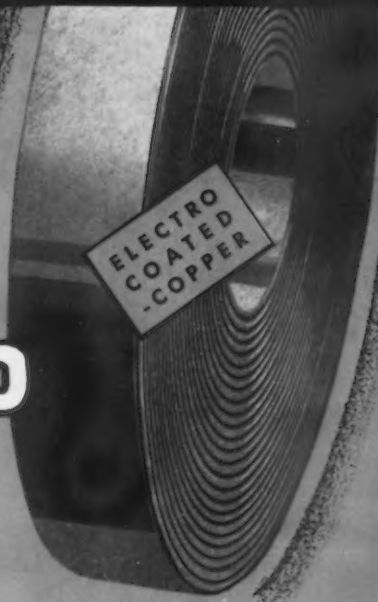


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Dr. Wirt and the Brain Trust



WE do not take much stock in Dr. Wirt's charge that there is a deliberate and organized attempt on the part of a group of brain trusters to force us into state socialism. There may be "pinks" or even "reds" in the advisory group, but they would never agree upon a plan. Any one with sufficient ego and individualism to believe that mere scholastic experience qualified him to redesign America would make a poor communist.

From the standpoint of public interest, however, *intent* is quite secondary to *effect*. The suicide is just as dead as though he had been murdered. So far as results are concerned, if the steps now being taken will ultimately lead to socialization or fascism it makes no difference whether these steps are directed by organized brains or take place because of a lack of them.

It is difficult to prove intent, easy to demonstrate effect. Dr. Wirt, for example, tells of a plan of the "revolutionists" to thwart recovery and drive Uncle Sam into the investment business. Discarding the question of intent, let's apply the question of effect to the capital goods industries.

WE know that in these industries is the great bulk of our considerable remainder of unemployment. It is agreed that recovery is not assured until these industries approach the level of consumer industries.

If one had a deliberate intent to block recovery in the capital goods industries, to keep its unemployed millions from getting work and to thus drive Uncle Sam into the investment banking business and

eventually into management of industry, he could have devised no more effective instruments for the purpose than the Securities Act of 1933 or the pending Fletcher-Rayburn Bill. The former has nearly dried up the stream of private long term investment. The latter bill, if it becomes law, will probably stop the remaining trickle.

It is doubly unfortunate that these bills which profess the purpose of protecting those with money to invest actually penalize millions of workers with no money by keeping them out of jobs.

Also with unquestionable effect toward socialization, even though without intent, are the Wagner Bill and the Cotton Control Bill, now pending, and the proposed Oil Industry Control Bill which is in preparation.

The Congressional investigation of the Wirt charges will not amount to much if it is confined to the question of intent. If it deals with the question of effect, regardless of intent; if it answers the question "Where are these steps leading us?", it may accomplish much.

AFTER all, the intent which prompts an act is not so important as the effect of the act. The kindly elephant who sat upon the nest while the mother bird was away had the best intentions in the world, but the effect of her act was disastrous.

J. W. Van Hook

How Irregular Operations Affect

ALL industrial plants using heating processes, and especially steel mills, during the depression have been making studies of the best methods of reducing fuel losses. This has become especially important owing to the necessity for production with a vast amount of idle time between operations. Small orders and immediate delivery have imposed a new problem in the relationship between production and fuel. Furnaces had to be lighted to fill possibly a small order only to be shut down when no more tonnage was in sight or held on warming fuel anticipating a renewal of operation.

The low amount of inventory carried and the insistence of short time shipments by customers seriously affect the best economy of furnace operations. Rising costs of fuel also have a direct bearing on the final results but operating schedules and frequent lighting up of cold furnaces are of paramount importance.

With all this in view, a study has been made on three 84-in. plate mill heating furnaces to try to analyze the factors influencing the number of light-ups as based against production. Although it is roughly known in advance what the answer is to be, this study has been made in an effort to reduce it to a quantitative basis. The purpose is to analyze the reason for the increasing fuel consumption. It is also made to show how delays on the mill due to mechanical breakdowns, roll changes, waiting on steel and scheduling of the mill operations affect fuel economy.

The furnaces used, from which these data have been assembled, serve the 84-in. plate mill of the Republic Steel Corp. in the Youngstown plant. These furnaces are 38 ft. long and 14 ft. wide, with an effective heating area of 532 sq. ft. They are triple fired, having a soaking chamber with a brick hearth where the slabs obtain a uniform temperature before being discharged, while the main heating section has both bottom and top firing.

Each of the three furnaces is equipped with a Blaw-Knox regenerative air preheater.

All of the data here presented are from actual operating records. Many times data are taken from test runs which are made after elaborate preparations and when conditions are adjusted to proper testing procedure and conducted under the critical eye of the test engineers. For that reason it was thought well to take actual quantities as reported to the combustion department. The gas quantities were obtained from integrating orifice

BASED on actual operating records of a plate-mill heating furnace, the author gives quantitatively the increased fuel requirements of intermittent or delayed production. His analysis is an illustration of the enhanced costs

flow meters and temperatures from recording potentiometer recorders.

The record assembled is shown in

Table I—Metal Charged in Heating Furnace and Gas Consumption

Run	Gross Tons Charged	Furnace Hours	G. T. Charged per Fce. Hour	M. Cu. Ft. Coke Gas	Million B.t.u. in Fuel	Million B.t.u. per G. T. Charged
1	987	72	13.71	4380	2260	2.290
2	862	72	12.00	4395	2278	2.620
3	240	33	7.26	1860	963	4.010
4	652	48	13.60	3465	1795	2.750
5	982	65	13.63	4635	2400	2.445
6	727	72	10.10	3945	2043	2.810
7	812	55	14.80	3181	1868	2.300
8	414	24	17.32	1740	901	2.175
9	655	48	13.65	2820	1461	2.230
10	324	22	14.73	1478	765	2.360
11	670	48	13.96	2840	1470	2.195
12	766	72	10.65	4151	2150	2.805
13	851	64	13.30	3934	2039	2.400
14	634	47	13.50	2838	1470	2.320
15	414	48	8.63	2646	1370	3.310
16	882	72	12.26	4001	2072	2.350
17	877	72	12.20	3975	2060	2.350
18	586	34.5	17.00	2405	1247	2.130
19	293	35	8.37	1800	932	3.180
20	760	48	15.83	3015	1562	2.055
21	645	48	13.45	3178	1647	2.545
22	749	61	12.28	3295	1758	2.345
23	555	48	11.57	2981	1544	2.780
24	353	48	7.36	2447	1268	3.590
25	433	48	9.03	2469	1280	2.955
26	278	48	4.79	2283	1182	4.250
27	622	48	12.98	2856	1479	3.030
28	690	56.5	10.45	3594	1860	3.150
29	401	33	12.16	2590	1343	2.990
30	574	48	11.95	3179	1648	3.220
31	645	32	20.15	2678	1385	2.150
32	749	42.3	17.70	2795	1449	1.931
33	555	32	17.43	2481	1286	2.315
34	353	32	11.02	1947	948	2.685
35	433	32	13.54	1969	1020	2.355
36	278	32	8.69	1783	924	3.220

Furnace Economy

By E. M. GRIFFITHS
Republic Steel Corp., Youngstown

brought about by the depression with its smallness of orders and demands for immediate delivery. The data were contributed to a symposium, so-called, on heat transfers conducted by the American Society of Mechanical Engineers.

Tables I, II and III. Each of the operating periods is designated by the run number, together with the num-

ber of gross tons charged and furnace hours operated. The furnace hours here tabulated referred to total time the furnaces were under fire, including holding time and pushing time. During this time the fuel was measured and reduced to standard conditions. From these data the total heat required and heat per gross ton was determined, based on the higher heating value of the coke gas assumed on an average plant analysis, which gave a heating value of 518 B.t.u. per cu. ft. This analysis is shown in detail on Fig. 4.

From this table Fig. 1 was plotted showing the relationship of the number of gross tons of steel heated per furnace hour against millions of B.t.u. per gross ton steel, bearing in mind this curve is based on total furnace hours. This curve, while not the true economy-capacity curve of the furnaces, nevertheless approaches it closely. It is to be pointed out that the irregularity of points is, no doubt, mainly due to variations in size and thickness of the slabs heated. Another factor that helps explain the irregular points is the fact that the furnaces may be driven lightly for only a portion of the time due to some delay and then driven very hard for the remainder of the time. With reference to the latter statement, consider the furnace heating at the rate of 5 gross tons per hour one-half the time and at 20 gross tons per hour the last half. The average of the fuel consumption of the two rates is $(4.17 + 2.13) \div 2$, or 3.15 million B.t.u. per gross ton, while the curve shows 2.48 million B.t.u. per gross ton for the average hourly tonnage of $(5 + 20) \div 2$ or 12.5 gross tons per hour, which falls in the region of the curve but is not so far removed as to be without reason.

Fig. 1 does not include light-up fuel, an average of which for three furnaces is 1125 million B.t.u., total for all three furnaces. This figure is used later to determine data for curves that are to follow.

Table II contains the preheated air temperature and flue gas temperature before the preheater determined by the recording potentiometer. The heat in the steel was determined by using 350 B.t.u. per pound of steel heated multiplied by the number of pounds charged.

The heat in the products of combustion was determined from Fig. 4. This figure was calculated for the average coke oven gas analysis during the period of operations observed. To determine the heat of the products of combustion, the B.t.u. per cu. ft.

Table II—Heat in the Furnace Gases

Run	Temp. of Preheated Air, Deg. F.	Temp. of Flue Gas Before Preheater	Heat in Steel, Million B.t.u.	Per Cubic Feet of Coke Oven Gas			
				Heat in Products of Perfect Comb.	Heat in 10 Per Cent Excess Air	Total Heat in Dry Flue Gases	Heat in Flue Gases Plus Latent Heat
1	900	1475	774	146.0	11.3	157.3	216.3
2	910	1465	676	145.0	11.3	156.3	215.3
3	800	1360	188	133.5	11.0	144.5	203.5
4	890	1480	511	147.5	11.5	159.0	218.0
5	860	1500	770	148.5	11.6	160.1	219.1
6	910	1440	570	142.5	11.1	153.6	212.6
7	875	1470	636	147.5	11.5	159.0	218.0
8	850	1470	325	147.5	11.5	159.0	218.0
9	820	1450	514	143.0	11.1	154.1	213.1
10	800	1475	254	146.0	11.3	157.3	216.3
11	840	1460	525	145.0	11.3	156.3	215.3
12	870	1430	601	142.0	11.0	153.0	212.0
13	910	1220	667	118.5	9.3	127.8	186.8
14	920	1220	497	118.5	9.3	127.8	186.8
15	900	1370	325	135.0	10.6	145.6	204.6
16	910	1460	692	145.0	11.3	156.3	215.3
17	890	1480	687	147.5	11.5	158.5	217.5
18	865	1465	460	145.0	11.3	156.3	216.3
19	900	1440	230	142.5	11.1	153.6	212.6
20	850	1330	596	131.0	10.2	141.2	200.2
21	940	1440	506	142.5	11.1	153.6	212.6
22	910	1410	586	139.5	10.9	150.4	209.4
23	920	1430	435	142.0	11.0	153.0	212.0
24	960	1400	277	138.0	10.8	148.8	207.8
25	880	1430	340	142.0	11.0	153.0	212.0
26	890	1415	218	139.5	10.9	150.4	209.4
27	780	1350	489	132.5	10.4	152.9	201.9
28	930	1435	541	142.0	11.0	153.0	212.0
29	900	1460	314	145.0	11.3	156.3	215.3
30	850	1435	450	142.0	11.0	153.0	212.0
31	940	1490	506	148.0	11.6	159.6	218.6
32	910	1470	586	147.5	11.5	159.0	218.0
33	920	1480	435	147.5	11.5	159.0	218.0
34	960	1440	277	142.5	11.1	153.6	212.6
35	880	1480	340	147.5	11.5	159.0	218.0
36	890	1470	225	147.5	11.5	159.0	218.0

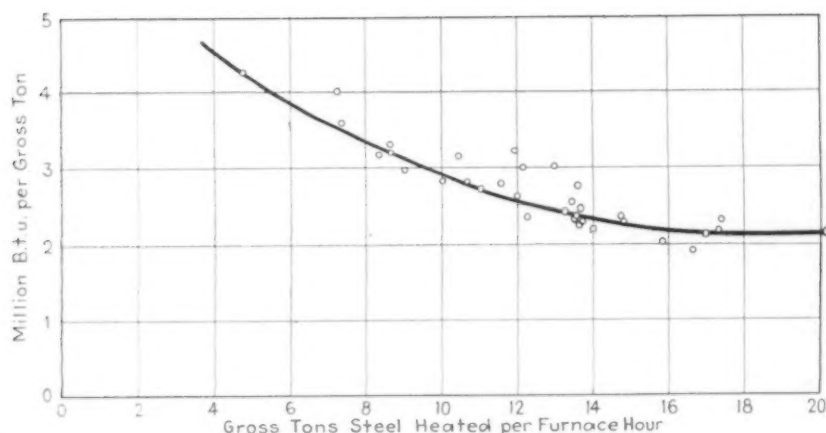


Fig. 1—Consumption of coke-oven gas by furnaces serving a plate mill, the gas based on a heating value for the gas of 518 B.t.u. per cu. ft.

of coke oven gas was read from the curve for perfect combustion. The value for one determination, at 1475 deg. F. is 146 B.t.u. per cu. ft. of gas. The heat in the air required for perfect combustion from Fig. 4 will be 113 B.t.u. per cu. ft. gas. Since 10 per cent excess air is used, this is 11.3 B.t.u. per cu. ft. of coke oven gas. The summation is 157.3 B.t.u. in the dry flue gases per cubic foot of coke oven gas. To which was added (518 — 459) or 59 B.t.u. per cubic foot of coke oven gas, giving the total heat in the dry flue gas plus latent heat due to water vapor of 216.3 B.t.u. per cubic foot of coke oven gas. The 10 per cent excess air was used as it was considered an average condition of operation on these furnaces. Pos-

sibly, reducing atmospheres would be expected but in the hands of average operators, a small amount excess is nearly always present.

Table III shows the per cent heat of coke oven gas (higher heating value) for various elements of the furnace system. The item of per cent leaving the furnace is the total heat plus latent heat of Table II divided by 518, or 41.8 per cent. The per cent of heat in the air is found by taking the air temperature, Table II, of 900 deg. F. and from Fig. 4 on the curve for heat in air required for perfect combustion the value of 66 B.t.u. per cubic foot of coke oven gas is found. To this 10 per cent is added, making 72.6 B.t.u. which divided by 518 is 14.05 per cent. Since all of the

eff gases from the furnace do not go to the preheater, the percentage loss in flue gases to the stack is $41.8 - 14.05 = 27.75$ per cent. The per cent of heat to the steel is obtained by dividing the millions of B.t.u. in the steel, Table II, by the millions of B.t.u. in the coke oven gas of Table I, or $774 \div 2260 \times 100 = 34.25$ per cent.

The total loss is therefore $100 - 34.25$ per cent, or 65.75 per cent. Therefore the per cent radiation, convection and conduction loss will be equal to $65.75 - 27.75 = 38.00$ per cent.

From the above data curves of Fig. 2 can be plotted.

Curve No. 1 is a duplicate of the curve shown on Fig. 1. This curve is the trend of heating but does not include light-up fuel.

Curve 2 is based on 15,000 gross tons per month with various furnace hour ratings with one light-up included. The light-up on these furnaces is equal to 1125 million B.t.u. or 375 million B.t.u. per furnace per light-up.

Curve 3 shows the same rating but two light-ups are included.

Curve 4 shows 10,000 gross tons

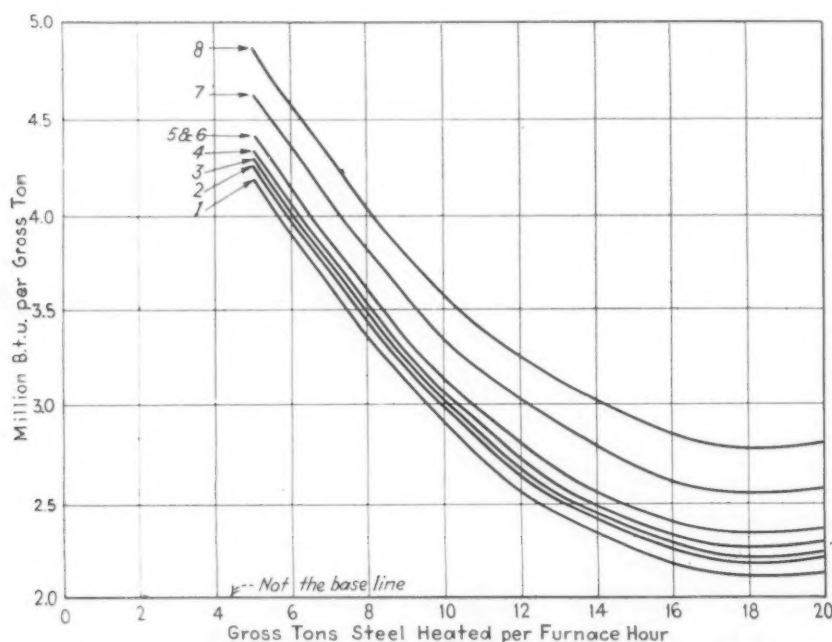


Fig. 2—The effect of the number of light-ups in a month as well as that of the tonnage heated on the fuel consumption is indicated by these curves: Curve 1 is a duplicate of that of Fig. 1. Curve 2 represents 15,000 gross tons heated in the month with one light-up; curve 3 is for the same tonnage but with two light-ups. Curve 4 is for 10,000 tons and one light-up, and curve 5 for the same tonnage but with two light-ups. Curve 6 is in superposition with curve 5 but is for 5000 tons and one light-up, while curve 7 is also for 5000 tons but with two light-ups, and curve 8 also for 5000 tons but with three light-ups.

Table III—Distribution of Heat (Coke)

Run	Leaving Furnace, Per Cent	To Air, Per Cent	Stack Loss, Per Cent	Oven Gas a Radiation Etc., Per Cent
1	41.8	14.05	27.75	38.00
2	41.5	14.19	27.31	42.99
3	39.3	12.47	26.83	53.61
4	42.1	13.81	28.29	43.25
5	42.3	13.38	28.92	38.98
6	42.0	14.19	27.81	44.30
7	42.1	14.11	27.99	37.76
8	42.1	13.17	30.93	33.01
9	41.2	12.70	28.50	36.31
10	41.8	12.50	29.30	37.50
11	41.5	13.10	28.40	35.90
12	40.9	13.50	27.40	44.65
13	36.0	14.13	21.87	45.38
14	36.0	14.36	21.64	44.53
15	39.4	14.00	25.40	50.85
16	41.5	14.18	27.32	39.33
17	42.5	13.18	28.82	37.78
18	41.8	13.46	28.34	34.76
19	42.1	14.00	28.10	47.26
20	38.6	13.15	25.45	38.05
21	41.1	14.70	26.45	42.90
22	40.4	14.05	26.35	40.25
23	40.9	14.66	26.24	45.56
24	40.2	15.51	24.69	54.06
25	40.9	13.72	27.18	46.22
26	40.4	14.32	26.08	55.47
27	39.0	12.33	26.67	40.33
28	40.9	16.23	24.67	46.23
29	41.5	14.19	27.31	59.28
30	40.9	13.30	27.60	45.10
31	55.6	14.80	27.40	36.10
32	36.8	14.50	27.60	31.90
33	37.5	14.75	27.35	38.85
34	40.2	16.59	25.41	45.34
35	38.5	13.72	28.38	38.32
36	42.0	14.49	27.61	47.99

per month heated with one light-up based on various furnace hour rates.

Curve 5 is the same as curve 4 except for two light-ups.

Curves 6, 7 and 8 are for 5000 gross tons per month with one, two and three light-ups respectively.

It is interesting to note from this analysis that curves 5 and 6 coincide, which shows that with the same varying furnace hourly rating 5000 gross tons per month with one light-up required the same total heat per gross ton as 10,000 gross tons per month with two light-ups. In a comparison of B.t.u. per gross ton, the curves show that the fuel consumption could be higher with an increase in monthly production depending on the number of light-ups and loading. Therefore, under certain conditions, the oft-repeated statement "that since tonnage has increased, the B.t.u. per gross ton should go down" may be in error.

The family of curves seem to turn slightly upward to the right at 18 gross tons per furnace hour. It is regretted that data were not available for investigating further this portion of the curves at this time.

Fig. 3 shows the furnace hours plotted against:

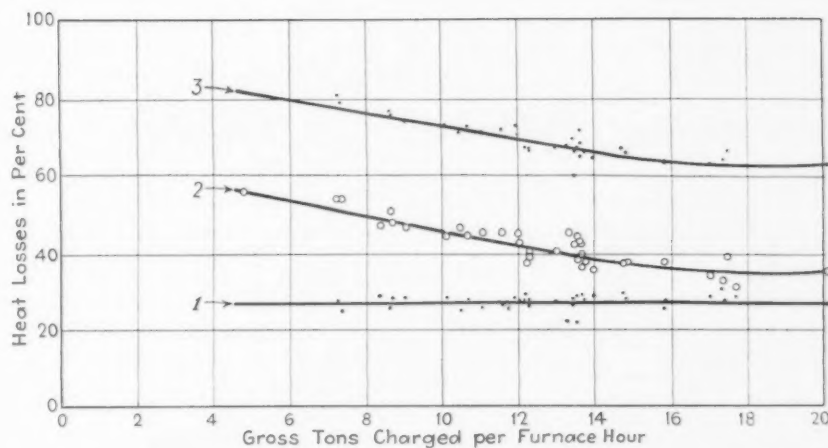


Fig. 3—Curve 1 represents the heat loss in flue gas to the stack; curve 2, the heat loss due to radiation, convection and conduction; curve 3, is the total of curves 1 and 2.

1. Per cent heat loss in flue gases to stack,
2. Per cent heat loss due to radiation, etc.,
3. Per cent total heat loss.

From Curve 1 it would indicate that the percentage of stack losses are relatively constant for all amounts of the number of gross tons per furnace hour operated. The absolute value may change but the percentage remains constant.

Curve 2 shows the decrease in per cent of radiation, convection, and conduction losses with increased tonnage per furnace hour.

Curve 3 is the sum of curves 1 and 2 and shows again that the probable maximum efficiency of these furnaces

is located about 18 gross tons of steel heat per furnace hour.

Losses in Frequent Startings

It has been a known fact that there are large losses due to frequent starting and stopping of furnaces and from the curves it would seem that decreasing the tonnage per furnace hour by 50 per cent increases the fuel required by approximately 50 per cent. This shows the disadvantage of small orders and quick deliveries imposed on steel manufacturers from the heating viewpoint and the necessity of trying to accumulate orders sufficient to make light-ups a minimum.

Delays to mills also have the same influence; the tonnage of steel per furnace hour is reduced and the fuel consumption mounts very rapidly.

Oven Gas at Higher Heating Value)

	Radiation, Etc., Per Cent	Total Loss, Per Cent	To Steel, Per Cent
7.75	38.00	65.75	34.25
7.31	42.99	70.30	29.70
6.83	53.61	80.44	19.56
8.29	43.25	71.54	28.46
8.92	38.98	67.90	32.10
7.81	44.30	72.11	27.89
7.99	37.76	65.75	34.25
0.93	33.01	63.94	36.06
8.50	36.31	64.81	35.19
9.30	37.50	66.80	33.20
8.40	35.90	64.30	35.70
7.40	44.65	72.05	27.95
1.87	45.38	67.25	32.75
1.64	44.53	66.17	33.83
5.40	50.85	76.25	23.75
7.32	39.33	66.65	33.35
8.82	37.78	66.60	33.40
8.34	34.76	63.10	36.90
8.10	47.26	75.36	24.64
25.45	38.05	63.50	36.50
26.45	42.90	69.30	30.70
26.35	40.25	66.60	33.40
26.24	45.56	71.80	28.20
24.69	54.06	78.75	21.25
27.18	46.22	73.40	26.60
26.08	55.47	81.55	18.45
26.67	40.33	67.00	33.00
24.67	46.23	70.90	29.10
27.31	59.28	86.59	13.41
27.60	45.10	72.70	27.30
27.40	36.10	63.50	36.50
27.60	31.90	59.50	40.50
27.35	38.85	66.20	33.80
25.41	45.34	70.75	29.25
28.38	38.32	66.70	33.30
27.61	47.99	75.60	24.40

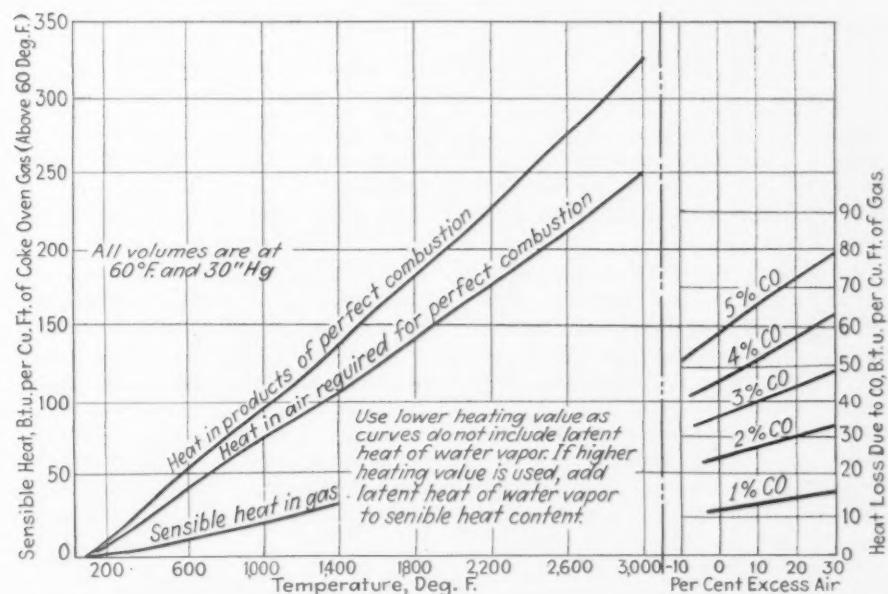
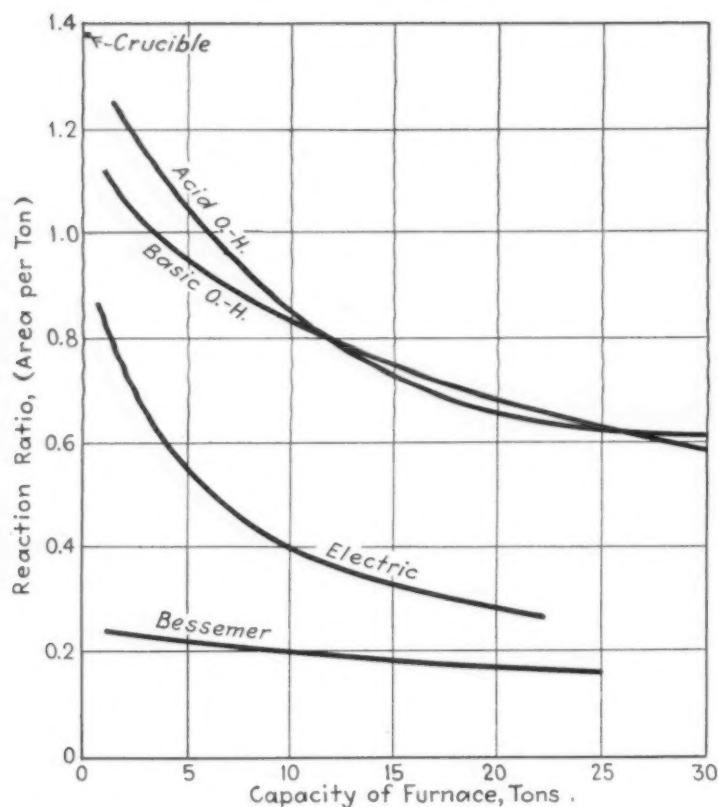


Fig. 4—Heat in the gas and air for different temperature conditions. The coke-oven gas is given a higher heating value of 518 B.t.u. per cu. ft. and a lower heating value of 459 B.t.u. The amount of air required for perfect combustion is 4.34 cu. ft. and the products of combustion amount to 5.05 cu. ft. per cu. ft.



REACTION ratios for Bessemer, electric arc, small open-hearth and crucible furnaces. ▲ ▲ ▲

IN comparison with other phases of human activities the sequence of fundamental advancements in ferrous metallurgy is generally considered a fair criterion of the existing tendencies, especially in steel making. With this in mind, some significance may be accorded to the peculiar fact that a period of about 30 years prior to 1900, or perhaps 1903, gave all the major steel making principles to the metallurgical world, while since then, i. e., in another period of 30 years, no distinctly new process has been discovered. Oddly enough, the advent of the almost spectacular research and systematic experimentation in metallurgy coincides just with these latter 30 years.

Judging from our present wealth of knowledge on the broad subject of metallurgy, one must nevertheless be impressed by the strides made during the last few decades, especially by minimizing the time-honored aspect upon steel making as "individualistic art." Scientifically accurate process and material control have since dominated the field of management to such an extent that the long years of experience required in the past, even for the production of ordinary grades of steel, are outdistanced by the judicious application of comparatively simple scientific principles.

The design of furnace hearths and quality of the ultimate product were two factors the relationship of which was perhaps the most puzzling of all problems confronting the practical man, ever since the advent of our contemporary methods of steel making. To what extent comparative studies may help in clarifying the same shall be indicated in the following paragraphs.

Reaction Surface and Ratios

THE problem of metallurgical reactions in connection with furnace characteristics may best be comprehended when compared with experiences gained from the simplest chemical experimentation.

In order to illustrate subsequent statements let us recall, for example, the addition of an aqueous solution of some hydroxide containing some phenolphthalein indicator to an aqueous solution of nitric acid, the first of the solutions being in excess. If the test is made in a very narrow test tube ($\frac{1}{4}$ in. I. D. for instance), it will readily be noted that the pink color of the added hydroxide solution will not reach the bottom of the tube, thereby indicating that the reaction occurred only near the surface of contact between both solutions. A repetition of the same experiment by using the identical concentrations and

Mass Effect

DOES the effect of mass in steel making warrant special study? Mr. Hruska thinks it does and suggests that quality of product needs to be considered in relation to the design of furnace hearths. What he styles the reaction ratio—the quotient of the bath area and the weight of metal—is here made a starting point.

amount of the reagents, but by pouring the solutions into a flat glass container (beaker, casserole, etc.), will show that the pink color covers the entire contents almost instantaneously.

In both cases the chemist will write the identical equation for the occurring reaction; but why was the reaction incomplete in the tube and why did it proceed so quickly in the flat vessel? Disregarding highly technical or even hypothetical explanations for this phenomenon, it is apparent, that the surface of possible contact of the two phases was small in the first experiment, whereas in the second case a large area of contact made a speedy reaction possible. Not even stirring with a fine platinum wire accomplished the desired result in the narrow container.

When applying this principle to reaction velocities in the production of modern steels one must bear in mind that the molecules of fluid steel are much less mobile than those of aqueous solutions. Hence, reactions require more time or a larger reaction surface to their completion, i. e., to equilibrium. From the same viewpoint, stirring or motion of the liquid metal will be less effective than in case of aqueous solutions. Two principal factors—besides temperature, concentration, mass and pressure—

and Quality in Steel Making

are therefore of importance to quality in practical steel making; viz., time and reaction surface.

In order to introduce the mass of the fluid steel into the account when dealing with metallurgical reactions, the writer has advocated a "reaction ratio," i. e., the quotient

$$\frac{\text{Bath area in square inches (A)}}{\text{Weight of metal in pounds (Wt)}}$$

The resulting value may, therefore, be defined as the reaction area in square inches per one pound of liquid steel in the respective melting furnace. The reaction ratio could, of course, be similarly expressed as the quotient of

$$\frac{\text{Reaction surface in square feet}}{\text{Weight of the metal in tons}}$$

Quite naturally, any deductions from these expressions must be identical for either of the two methods.

It appears from an extensive study of available data on various heats that maxima of deviations for our contemporary processes of steel making range from about 0.14 to 1.46 sq. in./lb. Realizing the similarity of many thermo-chemical reactions in the commercial production of iron and steel (decarburization, desulphurization, etc.) the lower of these limiting values seem to be indices of so-called tonnage steels, while the higher figures are characteristics of quality products. The extent of these variations for the principal processes is shown in the accompanying table.

Since all values given in the tabulation are based on actual determinations made under normal works routine, any conclusions derived from these data are indicative of modern melting technique and may, for these reasons, be generalized. Consequently, several new aspects upon steel making may be gained by scrutinizing the values. No metallurgist ever questioned the superiority of crucible and electric steels over grades made in large open hearth or Bessemer furnaces, i. e., on a heavy tonnage basis, and yet very little or no satisfactory explanation for this reality was ever offered either by research or by the practical metallurgical professions. This fact becomes especially significant when steels are produced in small melting

By JOHN H. HRUSKA
Metallurgical Engineer, Berwyn, Ill.

units and simultaneously in large furnaces, but of practically identical chemical composition. The grades manufactured in the small units (viz., under a high reaction ratio) are invariably of better quality.

Many a formerly perplexing problem seems capable of being clarified by the introduction of what has been designated as "reaction ratio." One may only refer to the many contradictory reports on the physical and metallographical properties of acid versus basic steels, which dispute has not been settled to mutual agreement—although exceptionally large sums were spent since the war to dispose of this very important metallurgical case. A little study of the accompanying diagram will amply prove this contention.

Considerable argument may be ex-

pected on the general applicability of reaction ratios in metallurgy. Thus, for example, to the chemist they may be meaningless, because none of his formulae, equations and calculations incorporate any effects of reaction surfaces nor actual masses entering chemical reactions. This is especially true of thermo-chemical reactions occurring at such high temperatures as in the fabrication of ferrous metals. To the steel maker, however, they are undefined facts of everyday experience; he knows that fine steels can under existing conditions be produced only in furnaces of a very limited capacity. So far he did not have any explanation for it. The metallurgist suspected from deliberations on thermodynamics, thermochemistry and simple shop practices that some fundamental basis must exist between the characteristics of melting equipment and the resulting physical properties of the product. Many mechanical, chemical and magnetic phenomena in ferrous matter point distinctly toward some basic law governing ap-

(Concluded on page 76)

Characteristics of Heats Made in Various Steel Making Furnaces

Melting Furnace			Reaction Surface for Specific Heat, Sq. In.*	Reaction Ratio for the Same Heat*
Type	Lining	Nominal Capacity		
Crucible	Clay	90 lb.	126	1.371
	Graphite	100 lb.	131	1.192
High frequency electric.		(Actual data not available)		
Electric arc	acid	0.5 ton	1,045	0.862
	basic	3 ton	4,210	0.600
	acid	6 ton	7,208	0.522
	basic	7 ton	7,420	0.470
	basic	10 ton	8,750	0.382
	basic	25 ton	15,100	0.253
Open-hearth	acid	1 ton	2,740	1.250
	basic	8 ton	14,610	0.830
	acid	10 ton	20,400	0.849
	acid	15 ton	22,800	0.712
	basic	20 ton	31,700	0.741
	acid	25 ton	34,700	0.654
	basic	25 ton	20,400	0.464
	acid	30 ton	42,000	0.653
	basic	50 ton	58,350	0.488
	basic	60 ton	69,200	0.487
	basic	120 ton	103,600	0.337
	basic	200 ton	105,100	0.221
Bessemer	acid	2 ton	905	0.220
	acid	15 ton	6,050	0.184
	acid	25 ton	8,150	0.147
	basic	16 ton	6,450	0.198

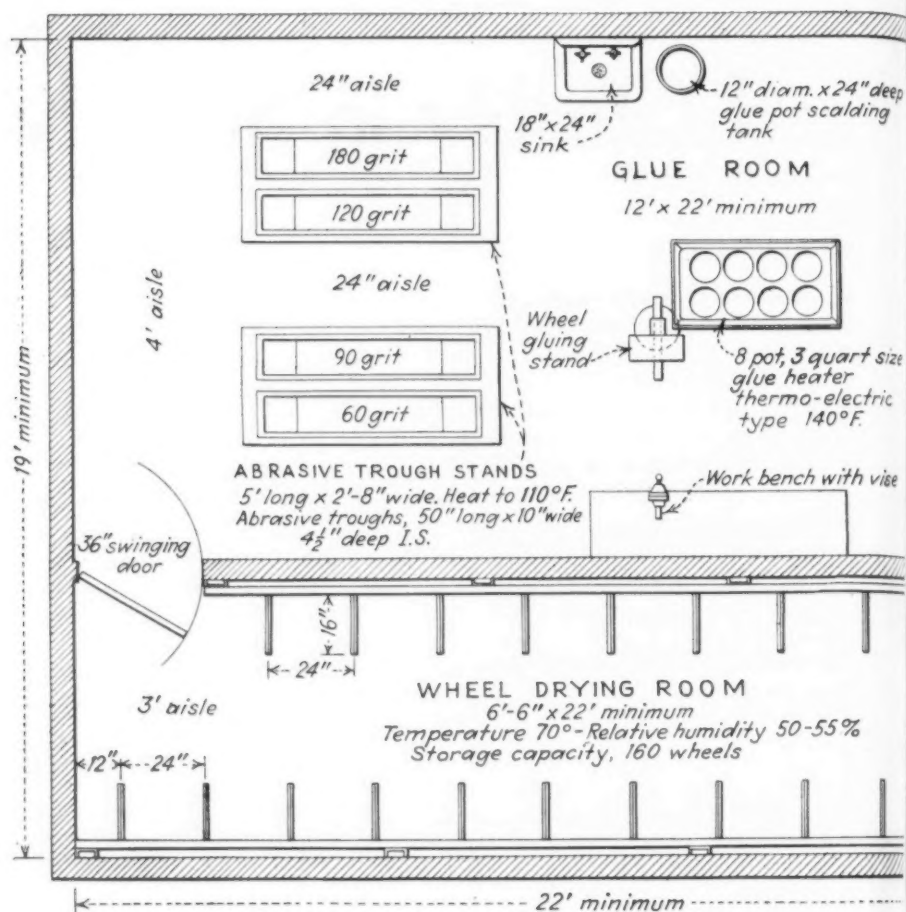
*All figures given above are based on actual determinations and not on nominal capacities.

PAY a dollar a day more for your glue and save \$100 a day in your finishing department. That is the rather startling advice received recently by a large steel company. The answer to the polishing problem, of course, is not as simple as just quality of glue, but this advice serves to give some indication of the importance of glue to the metal working industry. The humble glue pot—long associated with the cabinet maker—is in fact the pièce de résistance of the metal polisher.

In previous articles the importance of closely regulating the variables in connection with setting up polishing wheels was emphasized. Some of these variables were listed as temperature of the wheel, temperature of the abrasive, humidity, and nature of the abrasive, but nothing was said about the variation in the quality of the glue itself. Actually the problem of the manufacture of a suitable glue for use in preparing the head of polishing wheels has perplexed experts for many years. A delicate adjustment is required between the different properties of a glue. It must set hard and yet not be brittle, and it must hold the abrasive grains after the glued surface has been worn away.

Changing Temperature Doubles Life

The temperature of the glue at time of application is another important feature. One manufacturer now recommends holding the glue ready for use at 165 deg., whereas the common maximum some years ago was 140 deg. The temperature of the wheel on which the glue is spread has a lot to do with the property of the resultant head. In the experience of one company a difference of 20 deg.



Courtesy Divine Brothers Co.

Attractive Finish Helps

By HERBERT R. SIMONDS

in temperature of the wheel at the time the glue was applied increased the life of the head by 100 per cent. This temperature difference was an increase from 90 deg. F. to 110 deg. F. Obviously anything as important as doubling the life of polishing wheels is worthy of serious consideration.

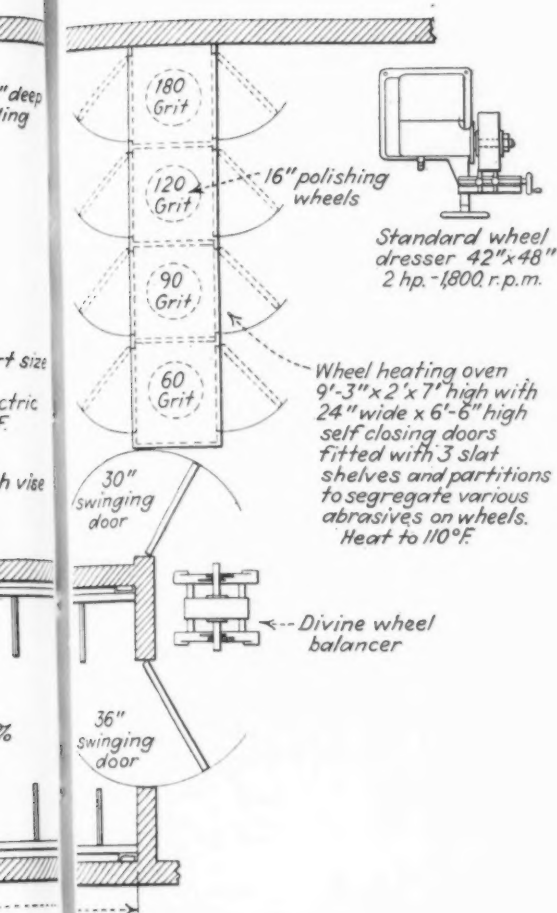
Under severe service, good practice indicates a polishing wheel life of not much more than 1 hr. The cost of reconditioning a worn wheel, together with the lost time of the polisher and the expense of handling, may run close to 50c. From this it may be seen that doubling the life of polishing wheels in a good-sized plant may easily result

in an impressive saving at the end of the year.

The Manufacturers' Viewpoint

The significance of the problem of compounding glue itself may be apparent from a statement by one of the

BY altering seemingly minor conditions, it has been possible to double the life of polishing wheels, and in a good-sized plant this may easily result in a saving of \$100 a



THIS plan indicates a convenient arrangement in the glue and wheel room of a large steel company's finishing department.

and from the same district vary from year to year, and properties which cannot be measured make up the working character of the glue. Under present conditions it is only long experience in this particular field, combined with practical judgment of the glue maker, which creates the most suitable product."

Glue alone of course cannot be blamed for all of the difficulty, as the surface characteristics of the abrasive play an important part in the final result. Many authorities feel that closer sizing in abrasives, with an irregular dull surface to each grain, is equally as important as the character of the glue. Certainly both the nature of the abrasives used and of the glue must be considered.

Handling Glue in the Shop

Temperature control of the glue pot is important. Most glues lose strength after being held for several hours at the temperature required for application. For this reason in shops where there is intermittent use of glue, two heats on the glue pots are required, one as a holding heat during the periods when the glue is not used, and the other the heat switched on for the time when the glue is used.

Another item overlooked is the fact that glue itself is subject to bacteria invasion and resultant deterioration. This emphasizes the importance of cleanliness of all equipment and the frequent changing of glue and cleaning up of glue pots and containers.

Some of the methods of applying glue to the wheel have already been described. Different conditions call for varying technique here as well as in other parts of the conditioning process. One polishing shop uses a concave pulley rotating in a hot water

Metal Products Sales

15—Polishing and Buffing

large manufacturers, the Milligan and Higgins Glue Co., New York.

"Starting as a matter of course with a carefully made glue of good test," this company says, "our experience has shown that it does not necessarily produce a polishing wheel of long life. Something else besides a regular commercial glue is needed to give desirable

results in this specialized application. Unlike joints between two solid materials, there is nothing in the case of the polishing wheel to support the glue, and it must stand up by means of its own cohesion and inherent strength. If the glue is brittle, the matrix will crack, and if it is not hard, the grain will rub off. Toughness and resistance are important qualities. Another property must be the ability to endure the heat of friction.

"Toughness calls for glue derived from the skin of animals accustomed to rigorous life and hard food. Typical in this class are the ox, the horse, the reindeer, and the antelope. For years efforts have been made to reduce the specification of a polisher's glue to a concrete equation, but definite formulae have not been established due to the variety in the source material. Conditions with the same kind of animal

day. The accompanying article describes some of the important features in building up a head on polishing wheels, and many points in modern buffing practice.

jacketed trough, which trough contains the glue solution. The pulley revolves in contact at its upper surface with the wheel to be set up, and in this way carries the hot glue directly from the pan to the surface of the wheel. Adjustment of the speed and the pressure of the pulley against the wheel determine the force with which the glue is applied to the wheel face. Often this operation is combined with hand brushing as the wheel revolves and occasionally auxiliary mechanical equipment such as an oscillating brush is used to make the process more nearly automatic and uniform.

Mechanical Application

Specifications for glue must take into account the nature of these various processes of application because, for one thing, glues differ as to foaming, and an oscillating brush or a rotating pulley might develop foam with some glues and not with others. A low foaming property is now frequently specified in a good polishing wheel glue. Foam means air bubbles enclosed in the glue, and this means potential weakness in the surface.

Another method of mechanically applying glue and abrasive is to mount the wheel on a horizontal spindle with the face resting in a trough of heated abrasive. In this position the wheel is revolved by means of a small motor at the same time that glue is brushed on to the upper surface. Some manufacturers have found difficulty in using this method, although it is one of the simplest of the mechanical processes and can be extended to include many wheels revolving on the same shaft. Usually the shaft is adjustable so as to give varying pressures against the abrasive in the trough. A better way is to have the shaft fixed, and to have the individual troughs adjustable against the wheels. On multiple wheels this method permits adjustment due to lower level of abrasive under one wheel than under another.

Special Compounds

Many special glues and glue compounds are on the market. Some of these are mixed with a solvent which evaporates as soon as the mixture is applied to the wheel and thus obviates the necessity of heating the glue. A compound consisting of glue mixed with abrasive is now available as already mentioned. This is applied to polishing wheels much as a buffing compound is applied, although it is claimed that the resulting surface for light work is similar to that created

by the usual separate application of glue and abrasive.

The difficulty of getting exact duplicate batches of glue is pointed out by Sherwood F. Prescott, Norton Research Laboratories. Only manufacturers who mix products from many sources are able to overcome variations in the source material and thus produce a glue of consistent qualities. Mr. Prescott says that glue should be stored in air-tight containers to prevent change in moisture content. He says further that different sizes of abrasive grain should be set up with different concentrations of glue solution. Coarse grain requires a more concentrated solution. He gives the following table as a guide for use of different sizes of abrasive grain:

Size of Abrasive	Per Cent Dry Glue in Solution
30	50
36	45
46	40
60	35
80	33
100	30
150	25
220	20

The viscosity of glue decreases as the concentration decreases in a manner which on a graph would be represented by a curve with a sharp bend occurring between the points of 40 and 50 per cent glue solutions. This calls for accurate weighing of the glue mixtures between these points. Mr. Prescott says that glue should never be melted with direct heat and recommends a thermostatically controlled water jacketed heater. To overcome deterioration due to high heat some manufacturers mix new glue with glue which has been heated for some length of time, but this is not good practice.

A booklet published by Divine Brothers Co., Utica, N. Y., gives the history of the development of glue for modern industrial purposes. This states that until recently no technical or scientific attention seems to have been paid to the use of glue for polishing. In developing a glue for this specialized purpose, manufacturers have discovered that there is a conflict between the strength of the glue and the strength of the metal being polished, and from this it is apparent



that the utmost possible strength in the glue is desirable.

Glue Standards

Many cases of complaints of polishing wheels were thoroughly investigated and in most of these the glue or its treatment was found at fault. Among other factors the effectiveness of the glue varies with the method of soaking, the proportion of water to glue, and the kind of glue. In 1844 a standard for industrial glues was set up, known as the Peter Cooper standard, and this still remains the only method by which glues from various makers can be compared. This standard, however, does not consider flexibility.

The National Association of Glue Manufacturers has published a booklet called "The Story of Animal Glue" which describes the sources of glue, the method of manufacture, and properties in service. This booklet, among other things, points out that ground glue is a more suitable form for the polishing industry. One of the chief advantages is quickness of soaking. In addition to saving of time and equipment, this means less danger of mistreatment through overheating and less likelihood of taking more glue out of storage than required for any one job. In addition to this, ground glue lends itself more easily to blending.

Examples of Wheel Life

Robert T. Kent, Divine Brothers Co., Utica, states that the short life of a polishing wheel head means an excessive amount of lost time in changing wheels and also means reduced production. He finds that short life is usually the result of poor holding power of glue, which indicates that the abrasive grain is torn from the wheel before it has been used up in cutting the metal. This is wasteful and increases the expense of abrasives. Mr. Kent says:

"The interested manufacturer will naturally use data on wheel head life, production, and wage rates that apply to his particular case. One method of investigation is as follows:

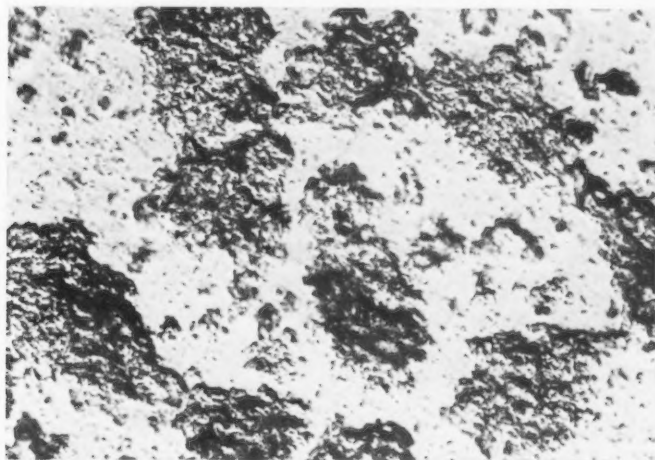
"Find out how long a particular wheel lasts on a given job, how long it takes to change wheels, and the annual bill for abrasive grain and glue divided by the number of wheels. Then find out the average time for setting up a wheel.

"Assume that the polisher receives 75c. an hr., and that his normal production rate is 60 pieces an hr. Assume that his wheel lasts half an hour and that it takes 2 min. to change a wheel. The loss in wages for changing wheels in this case would be 40c. per 8-hr. day. Assume that the setting up of a wheel with two heads requires 3 min. and that the set up man re-

elves 60c. per hr. Then the wage cost of setting up the two wheels is 6c.

"The cost of abrasive and glue for a 16 in. x 3 in. wheel, set up with No. 120 grain, should average about .025c., making a material cost of 5c. an hr. for the two wheels, or a total wage and material cost of \$1.28 per day. If the life of the wheel head is doubled the direct cost will be cut in two and the saving will be 64c. a day per polisher. In addition there

- 4 Prepare a quantity which will be used up in less than 4 hr.
- 5 Thoroughly clean all pots and utensils.
- 6 Do not mix old glue with fresh glue.
- 7 Heat the polishing wheel to 110 deg. F. before applying the glue.
- 8 Heat the abrasive grain to 120 deg. F. before rolling the glued wheel in it.
- 9 Dry the wheels for 48 hr. at close to 70 deg. F.



Courtesy Barnsdall Tripoli Co.

THIS photomicrograph shows the peculiar porous character and absence of sharp edges of the natural tripoli grain. This material, combined with grease or other binders and made up in bricks or bars, forms one of the most widely used buffing compounds.

will be the profit on the increased production and the absorption of some shop overhead during one wheel-changing period. On this basis a saving of \$1.25 or more per polisher can be shown. In a room employing only ten polishers this would amount to between \$3,000 and \$4,000 a year."

Directions for Glue Handling

From this the question naturally arises, how can the life of the wheel head be doubled? Mr. Kent feels that the answer is simply one of proper selection and handling of glue. He says it is poor economy to buy glue for polishing, on a price basis. First-run glue is the strongest and toughest and its higher price is negligible in comparison with the saving in setting up polishing wheels. The friction of the wheel on the work generates large quantities of heat which tend to soften the glue. Having selected the proper glue, Mr. Kent then gives the following directions for its handling and use:

- 1 Use distilled water.
- 2 Soak the glue for 3 hr. in just the right amount of cold water (not above 65 deg. F.).
- 3 Melt the glue at 140 deg. F.

- 10 Maintain the relative humidity between 50 and 55 per cent.

Use of Hydrometer

In soaking up the glue in water some manufacturers find it advisable first to mix the glue in a small amount of water and then dilute it to the proper consistency with warm water after the glue has melted. When this is done, a hydrometer is used to determine the percentage of glue and water. Water is added until the hydrometer indicates the percentage called for by the particular size of grain being used.

The effect of varying humidity on the life of the head of a polishing wheel is sufficient to warrant most manufacturers in installing some type of air conditioning equipment. One manufacturer says: "It took a breakdown in our air conditioning system to prove its real worth. During the time of our breakdown we used, roughly, twice as many polishing wheels for the same work as required when the system of carefully controlled air conditioning was in service."

After metal surfaces have been polished, the polishing lines may be removed and the character of the surface altered by a further process known as buffing. This process, as already described, makes use of cloth buffs or wheels composed of disks of cloth or similar pliant material. The disks may be sewed together in various ways or may be held together at the center only, leaving the outer portions free. Varying compounds are applied to these buffs, depending upon the results desired. Usually buffing comes under two classifications, the first known as cutting down and the second known as coloring. For the cutting down process one of the most popular compounds is tripoli, which is a form of silica rock found in natural deposits. The value of this product for buffing results from the fact that each particle is porous and has a fibrous structure with no sharp edges or corners.

Tripoli Compounds

The Barnsdall Tripoli Co., Seneca, Mo., one of the largest producers, gives the production of tripoli in 1929 as 16,000 tons. This company obtains the product in open quarries, after which the crude stone is sorted for color and grade and then is placed in drying sheds. Experience indicates that weather drying produces a better grade than artificial drying, and therefore extremely large sheds are needed, as the process of weather drying requires from three to six months. Two colors and three grades of fineness are produced. The finest grade, known as air float, passes through a 200-mesh screen. This is used to make a paste for the most delicate buffing processes.

The best selection of tripoli compound is made by the metal finisher after trial with many grades. When a compound leaves a haze on a metal surface it is usually a sign that there is too much grease. On Monel metal and nickel it is especially important to have a compound made up with a minimum of grease to develop the deep color usually desired. Tripoli is sometimes omitted even where a high luster is produced, but when it is successfully dispensed with it means that the previous polishing and emery buffing have been adjusted accordingly. Fine emery and tallow form another compound freely used in the early stages of buffing. Cakes of emery and paste are made up with various sizes of grits. This compound used on spirally sewed buffing wheels is an operation which in a sense is midway between polishing

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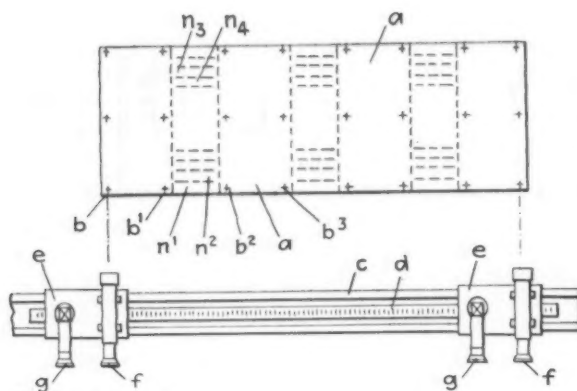


Fig. 1.—Diagrammatic representation of a cylindrical test specimen, which is first marked with crosses, then measured and then machined in several stages at various points. After each stage of machining the distances between crosses are measured.

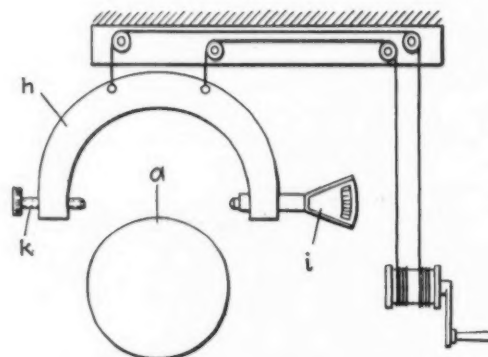


Fig. 2.—Diagrammatic representation of the caliper gage for measuring the diameter after each step in machining.

Apparatus to Determine Stresses in

TWO forgings that are "made in the same way" and from the same material may differ to such a degree in point of the magnitude and nature of their internal stresses that when two identical machine parts are produced from them one may fulfil its task properly while the other may not.

Tests have revealed the complicated nature of the stresses often encountered. For example, there are peripheral stresses, or spiral-shaped stresses running along the outer layers of a solid cylinder, also radial and axial stresses, or stresses at an angle to the axis of the specimen and so forth. These various stresses may arise singly or in common and be of a varying nature and magnitude at different points. Accordingly it is a great asset to the designer if he be in a position to ascertain the magnitude and

By **RENE W. P. LEONHARDT**
Consulting Engineer, Berlin, Germany

direction of the stresses occurring in a given metal.

In these tests a cylindrical specimen that has been subjected to deformation is given a certain number of cuts of varying depth and width so that the layers of the material containing stresses are removed. The stresses remaining in the untouched layers produce slight alterations in the shape of the test specimen; these alterations can be determined by a special precision measuring equipment.

The difference between the values measured prior to the cutting process and afterward permits some conclu-

sion to be drawn as to the nature, direction and intensity of the stresses remaining in the unmachined parts of the test specimen and also as to the dissipated stresses in the removed layers. If the cuts are continued after each series of measurements, the subsequent measurements on the untouched parts of the specimen will again produce correspondingly new values, provided stresses existed in the layers removed by the second, third or further steps in machining.

These processes are diagrammatically represented in Figs. 1 to 5. Prior to the test, the cylindrical test specimen "a" is polished on a lathe and its surfaces marked by a scribing tool with microscopically fine crosses b, b^1, b^2 , etc., the number and position of which depend upon the accuracy of the results required. The distance of these marks from the first

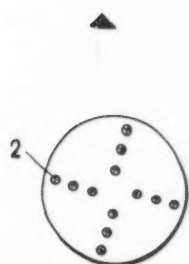


Fig. 3. — Diagrammatic representation of the face of a test specimen with pins and crosses.

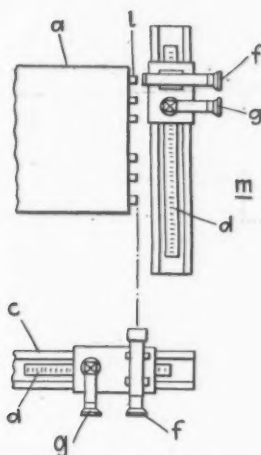


Fig. 4. — The distance from the face of the pins to the first crosses and the intervening crosses as well as the radial distances of the crosses apart are measured.

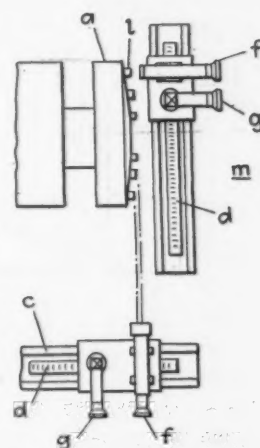


Fig. 5. — Layers with longitudinal shearing stresses are removed by machining in the vicinity of the faces. Differences in dimensions as compared with the conditions obtaining prior to machining are ascertained. Alterations in radial stresses are revealed by alterations in the distances between crosses on the face.

Large Castings and Forgings

mark is established by a comparator in the conventional manner. In Fig. 1, *c* is the carriage of the comparator, *d* the scale, *e* the measuring slide, *f* the adjustable telescope, *g* the microscope; each of the latter has a thread micrometer in the field of vision.

After the distances of all crosses have been ascertained, the diameter at, and between, them is measured by means of the caliper gage *h*, Fig. 2, the arms of which carry a micro-calipering device *i* and a screw *k*. When calipering the test specimen, readings are obtained on the device *i*, which can be taken as starting values for the differences which may possibly obtain during the subsequent series of measurements; their virtual value can be ascertained by parallel precision gages. Figs. 3 and 4 reveal that the front side of the cylinder can be provided with pins 1, having

HERE is a German machine of precision built to measure the swelling or contraction, as the case may be, of a mass of metal as machining removes stressed portions. Telescopes and microscopes form part of the equipment, and automatic means are provided to maintain everything in the testing room at a constant temperature.

crosses marked on their faces, the position and distance of these marks being determined by a special small comparator *m* and by the large comparator in Fig. 1. If it is possible

to turn the test specimen through an angle of 90 deg. in an horizontal plane, the large comparator can also be used for measuring the faces.

All the lengths and diameters thus obtained provide the basis for the subsequent verifying measurements that have to be effected after each step in machining.

The cuts n^1 , n^2 , n^3 , etc., indicated in Fig. 1 by dotted lines, are now made. If the exposed annular-shaped layer n^1 contains longitudinal shearing stresses, the section *b* to *b'* becomes longer, and the section *b* to *b''* becomes shorter than before the annular-shaped layer n^1 was removed; if radial stresses were present, the diameters at *b'* and *b''* would have altered accordingly. The penetrating effects of radial stresses are obtained from the ratio of the diameters after

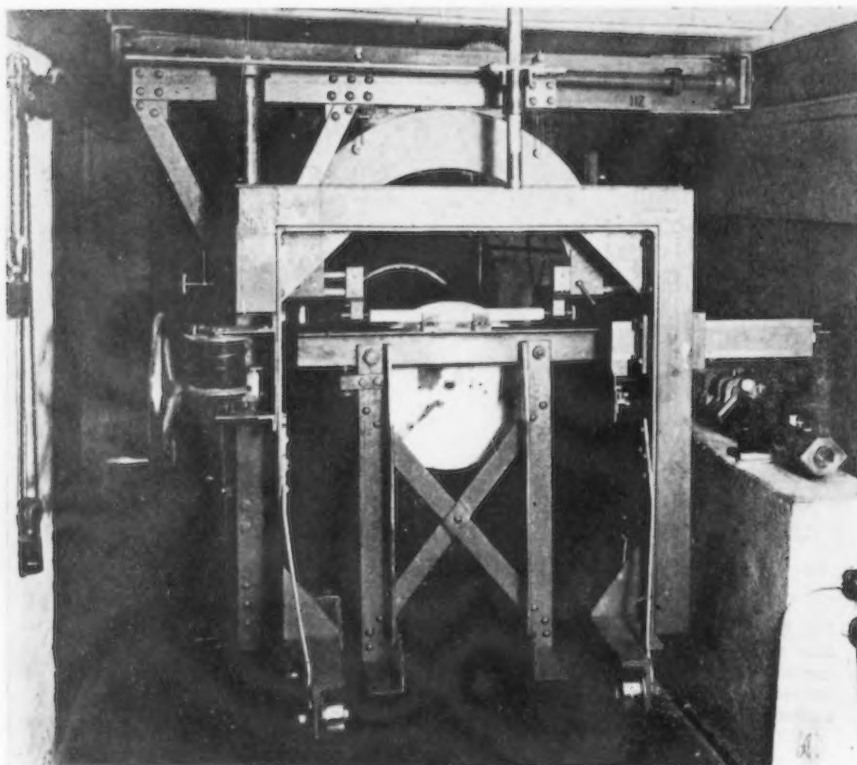


Fig. 6.—Calibrating the caliper gage by means of slip gage.

exposing further annular-shaped layers n^2 , n^3 , etc. Peripheral stresses are revealed by the alteration in the diameter of a ring which is cut out from the solid material on the face of the specimen and slit transversally at one point.

A ring can, of course, also be cut out at any other part of the test specimen; but while the separating slit is being made and measurement is being undertaken, the ring cannot be removed from the test specimen as its inner diameter is smaller than the diameter of the neighboring parts of the specimen. Fig. 5 shows the deformation of the face of the still unmachined test cylinders (Fig. 4) after making a deep insertion in the vicinity of the face.

If spiral-like stresses exist, their torsional effect would be interrupted by successive cuts so that the cross-marks which were originally scribed in a longitudinal plane parallel to the middle axis of the cylinder, are now somewhat displaced relative to each other. This signifies that the initial position of the cross-marks forms the starting point; its new position (due to interruption of the stress by the exposed layer) forms the end point of a small arc on the periphery of the testing cylinder. The length of the chord of this arc can be easily determined by a thread micrometer in the field of vision of a telescope so that the value of this kind of stresses, which may remain in forgings when

adopting spiral-fashion cooling, can be ascertained with the outfit.

The diameter of the test specimen can also be ascertained while omitting the caliper gauge and slip gage, if it is possible to slew the compara-

tor, or better still the test specimen, horizontally through 90 deg., provided the small comparator bed (Figs. 4 and 5) has not already been provided from the start. For this simplified case, only two horizontal caliper pieces with one cross-mark each need be pushed against each side of the cylinder wall, the telescope being directed to the cross-marks and the longitudinal values read off the scale. This measurement can also be conveniently accomplished by the large comparator Fig. 1.

Figs. 6 to 9 show an equipment which has already been proved in service and with which measurements were carried out in accordance with Figs. 1 and 2. On the front of Fig. 6 is a frame with slip gage, immediately behind is a rigid frame running on rollers and resting on the lathe bed and fitted with the caliper gage and a worm winch for raising and lowering the gage; on the right-hand vertical part of the frame is the scribing tool and to the right on the solid foundation the comparator with guide bed, measuring slide and optical equipment. The test cylinder (in the center) rests on strong roller-bearing pedestals.

Also during machining, the test specimen is carried by the roller-bearing pedestals; as it must always have a uniform temperature which coincides with the room temperature

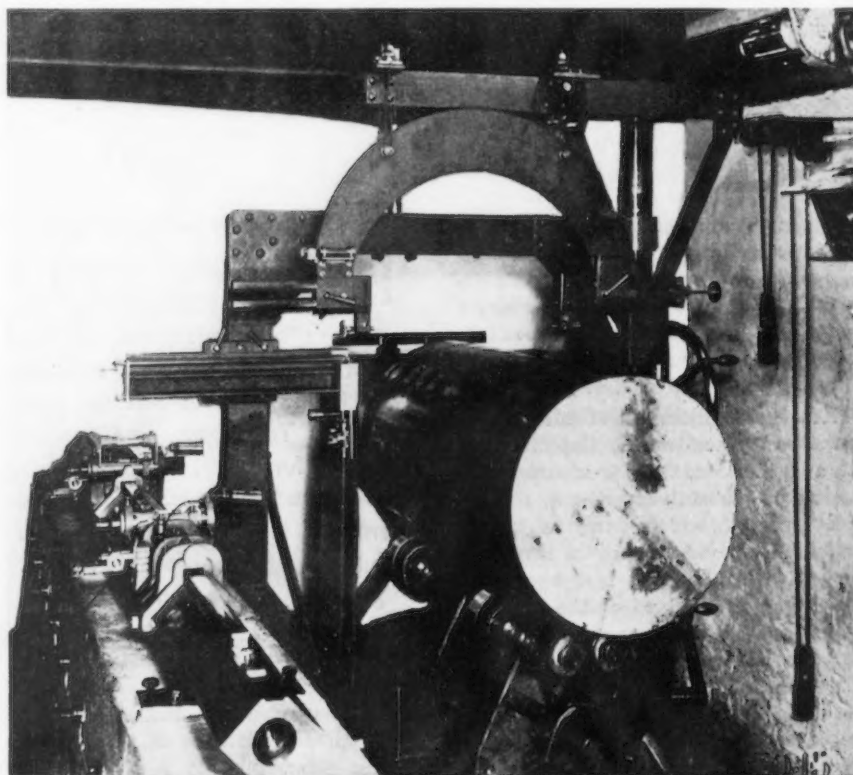


Fig. 7.—Horizontal comparator, caliper gage (raised) and scribing gear.

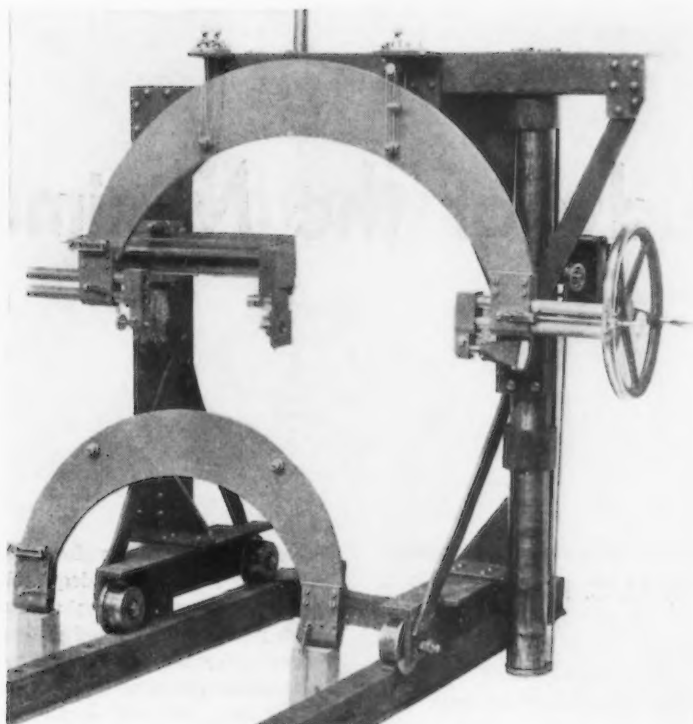


Fig. 8.—Large and small caliper gage.

during this period, about 10 to 12 flexible thermo-elements (not visible in the illustration) are distributed over the entire length of the specimen, and the reactions of the elements can be read off in sequence on the scale of a mirror galvanometer.

Fig. 7 gives a good view of the scribing tool under the calipering screw of the caliper gage, which is arranged on a long horizontal clamping piece, carrying at its free end—above the comparator—an operating crank and key.

Test Room Kept at Constant Temperature

To carry out the series of investigations at the same temperature, the test room is maintained at a constant temperature. This is accomplished by a temperature control specially developed for this purpose. Ten resistance thermometers, distributed over the room, are connected by means of a push-button panel to the indicating instrument (Fig. 9). Regulation of the temperature is accomplished in the following manner:

The absorbed ambient air is conducted over hand-controlled electrical heating resistances. The air is circulated by a number of fans with the resistance immediately behind the blades. Regulation is brought about by two minimum and maximum contact thermostats adjusted to react to temperatures between plus or minus 3 deg. C. When the temperature drops, the minimum contact thermo-

stat switches in the heating resistances of the fan through an intermediate relay. When the maximum temperature is attained, the heating resistances are disconnected automatically.

The equipment enables differences in diameter and length to be established to within 0.005 mm.; it can, of course, also be adapted to even more exacting conditions. In the above arrangement, however, it permits the admissible load to be computed to within $\frac{1}{2}$ kg. per mm.² (700 lb. per sq. in.). Summarizing, it can be claimed that the development of the method and equipment

marks a great step forward in analyzing the characteristics of highly stressed castings and forgings, and is therefore of prime importance in testing such engineering products as rotor shafts.

Mooney Uses Hydraulic Analogies in New Book

"The New Capitalism," by the prominent industrialist, James D. Mooney, and just published by the Macmillan Co., New York, is, in its essence, a popular book of economics. It possesses extreme clarity of text, and has an entirely unique pictorial presentation which renders the subject real and tangible. A large proportion of the book is devoted to striking pictures of the current American scene, the object of which is to graphically portray the human side of production and consumption, and the individual's place in the unfolding economic system. The latter portion deals with economic and monetary laws, but the approach is most attractively fresh by virtue of the use of hydraulic analogies as a help in exploring economic laws. By the use of "econo-dynamics," an isolated supply and demand case is first considered, but the subject is gradually expanded to include the gold standard, revaluation, taxes, credit and commerce, with emphasis on the dangers of a shorter work week.

The Pennsylvania Railroad has placed orders amounting to over \$500,000 with the Allis-Chalmers Mfg. Co., Milwaukee, for electrical propulsion and control apparatus with which to equip fourteen switching engines. The new engines will be built at the Pennsylvania's Altoona, Pa., works. Their cast steel frames, orders to be announced later, will be produced outside.

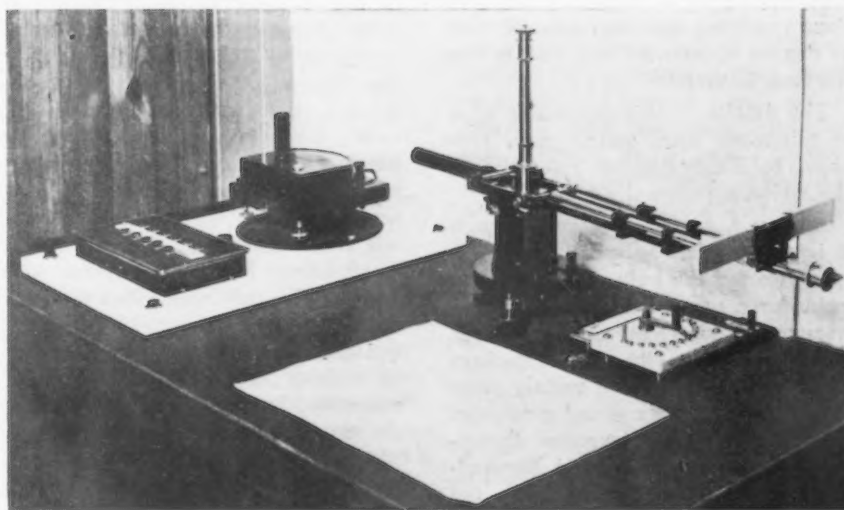


Fig. 9.—Measuring the room temperature on a milli-voltmeter with resistance thermometer. On right, measuring the temperature of the forging on mirror galvanometer with thermal elements.

A Practical Study of the Minimum

THERE is probably no single industrial problem as to which the confusion of popular, and even of trained and experienced, thinking is greater than in connection with that of the establishment of minimum wages.

The skilled executive, who is thoroughly opposed to the usual theories of minimum wage fixing, may still tend to establish his own scales of minimum wages for each class and group of employees—and the measure of his skill will ordinarily be the excess of such wage rates over those generally current in the market from which he draws his working forces. A consideration of this, which may be called the natural or "market" theory of minimum wages, may serve, perhaps, as the background for an examination of other theories.

Minimum wages under this "market" theory may vary somewhat as between establishments in the same locality and industry, but the tendency in any given area is toward a uniformity of such rates for similar occupations, or at least for occupations requiring the same general kind or degree of natural aptitude in the workers involved.

The details of this particular type of minimum wage fixing may, perhaps, be illustrated by reference to the writer's personal experience.

During a period of several years, it happened that he was directly responsible for the bulk of the employment for a particular class of young women workers in an important Middle Western city. The workers in question were drawn mainly from among recent public school graduates and the existing employees of department stores, factories, and five-and-ten-cent stores, and also from the ranks of clerks, typists, and the less skilled stenographers. The marriage rate was high among the young

By **M. C. RORTY**
Past President
American Statistical Association, and
Former Vice-President
International Telephone & Telegraph Co.

women in question and, for this reason alone, the rate of labor turnover continued to be very substantial, even after other sources of turnover had been reduced to a practicable minimum. It was necessary, therefore, to maintain a highly organized employment and training bureau and to engage several hundred new employees each year.

Degree of Natural Aptitude

In the systematic development of the working force for quality and efficiency of production, the first fact to be clearly established was that only about one applicant in four had a natural aptitude for the work involved. The employment bureau was therefore instructed to report promptly whenever the ratio of applicants to vacancies fell below the four to one figure. The bureau was also limited, in its advertising for applicants, to certain routine notices regarding the availability of positions, and was cautioned against any attempts to use "high-pressure" methods for the purpose of securing new employees. These restrictions were imposed in the belief that a sound development of the working force in question could come only as the result of making the positions adequately attractive in wages and working conditions as compared with other employment.

The second stage in the development of the plan of employment followed naturally from the preceding. The starting wage was gradually in-

creased until it was found that the required supply of adequately qualified new workers was assured with a 15 per cent excess of their starting wages over the wages current in the particular fields of employment from which the selected applicants were drawn. Such differential was then maintained on the basis of personal investigations made by the writer at six-month intervals, or oftener, in case any reduction in the supply of applicants indicated the need.

More Pay or Shorter Hours?

The only variation from the preceding rule was of some interest, although its applicability was limited, perhaps, to the special problem of employment for young women who, in the main, were living with their families. A particular investigation showed the desirability of increasing the wage scales by about 10 per cent. At the same time the writer was anxious, as the alternative, to reduce the working hours by about 11 per cent. The increase in payrolls would be about equal under either plan, but his fear was that the employees would prefer the wage increase to the reduction in hours. On this point there were several lengthy executive conferences, which arrived at no definite conclusion. Finally, the writer decided to take advantage of his close acquaintance with some of the older employees to resolve the difficulty by direct inquiry—with the result that the decision was convincingly in favor of the shorter hours. As the sequence to this experience, a continuing balance was thereafter maintained between wage differentials and other elements of attraction in the employment—although minimum wage differentials of 10 per cent or more, as compared with outside employment, were still maintained.

A supplemental and very important

Wage Theory



element in the preceding plan was the fact that each change in the minimum wage was extended pro-rata throughout the entire range of the wage scale. The initial wage was varied as might be necessary to maintain the flow of new applicants, but equal care was taken to continue those relative differentials, according to expertness, length of service, and rank, which had been found necessary to reduce labor turnover and maintain an "esprit de corps" throughout the entire organization.

The Ultimate Test

At the end of several years, the ultimate test of the program came through studies of comparable situations which showed that wage rates for the group of employees involved were close to the upper limit, as compared even with localities where the average of market wages was substantially higher, while unit costs of product were among the lowest, and, in addition, quality of product stood in the top rank. In this latter respect, a very interesting result was the discovery that an adequate insistence on quality resulted in restricting the rate of output to that figure which represented a rhythmic smoothness of effort, with an apparently complete absence of strain on the workers. At least the personal testimony of many operatives was that strain was felt only when the smooth flow of output, for some reason or other, was temporarily disturbed.

In the writer's analysis of this particular experience, one of the most troublesome questions was as to what might have been the conditions if all employers in the area had followed the same program. At first thought it seemed that any such general effort would have tended to nullify itself and to prevent the gains in effi-

ciency which had resulted in the particular instance under observation. But on further consideration this did not seem to be the case.

What had occurred was the selection, from among a large class of workers, of a particular group who had qualifications for more effective special work and for higher earning

THE establishment of minimum wages in industry is part and parcel of the New Deal philosophy. This statement requires no proof since virtually every code under NRA establishes such a provision.

Yet, as Col. Rorty says, there is hardly any single industrial problem which involves more confusion of thinking.

In this able and original study of the subject, the noted author gives us much food for thought. He arrives at the conclusion that the answer to the problem lies in disassociating minimum wage practice from perversions of the minimum wage theory in justification of impractical attempts to force general increases in wage levels.

power. The essential factor for such increased efficiency was not only natural aptitude, but a reasonable *uniformity* of aptitude, for the particular work involved. It was not at all certain that those who remained in their original occupations were of lower average efficiency in such work than before the selected employees had been withdrawn. Their wages had not, in fact, decreased, and the entire operation had clearly resulted

in raising the average, and to some extent the basic, standards of wages in the community. Furthermore, it seemed quite certain that no normal development of such specialized selection of workers for particular tasks could seriously embarrass the more skillful employees or result otherwise than in an accentuation of a desirable trend toward increased average wages and efficiency of production. Under the most extended application of the principle in question, it seemed clear that increases in operating efficiency would fully, or more than fully, offset the resulting wage increases. The gains, in the end, would be real, and not a mere counterbalancing of higher prices against higher wages.

"Natural" Minimum Wages

As opposed to the usual viewpoint toward minimum wages, it appeared, nevertheless, that an accentuated tendency toward "natural" minimum wage fixing by skilled employers would create new gradations in skill and added variations in wage levels among the workers in the lower paid groups as a whole. The resulting *lowest* paid group might be greatly reduced in numbers. The money wages in this group might not decrease. Their real wages should, in fact, increase as the result of lower prices resulting from general increases in productive efficiency. But, barring technical developments which might operate in the reverse direction, the effect of all skilled personnel and executive work, and of all offers of money and other incentives to workers for increased efficiency of production, must, it would seem, be in the direction of increasing rather than of decreasing the range of variation in wage rates.

To step from this background of experience and practice in minimum wage fixing to a consideration of the



current and more popular theories, requires an intermediate clearing of ground.

Two Theories of Wage Fixing

Broadly speaking, there are only two basic theories of wage fixing.

The first theory assumes that prices will be regulated by competition, or by public authority, in such manner that "profits" will be restricted to the average figures necessary for continued industrial growth and progress, and that average real wages, except for cyclical swings, will vary substantially in accordance with the productivity of labor. This theory assumes, also, that, with a just average of real wages thus established, relative wages in various occupations and localities may be trusted on the whole to adjust themselves to levels determined by relative productive value, and that any temporary local or occupational variations from normal wages will tend to be self-regulatory during periods of reasonably active business by reason of a minimum annual labor turnover of, perhaps, 15 to 20 per cent, and the related shift of workers to other localities and occupations, or through an equivalent shift of industries to areas where wages are subnormally low.

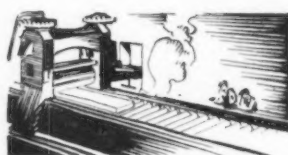
The alternate theory of wages assumes that wage rates will be determined by collective bargaining or legislative enactment and that, subject also to a reasonable limitation of profit margins, the general price level will adjust itself to the levels of wages thus established.

If we exclude possible difference in productive efficiency as the result of the application of these separate theories, we may assume that either one, at any given stage of economic development, will result in the same general average of *real* wages, although the second theory may involve certain artificial increases in the *money* levels of both wages and prices. Furthermore, the processes of collective bargaining do not necessarily involve changes in the relative wages of different classes and groups of employees, however much they may raise the *money* levels of average wages.

A Practical Assumption

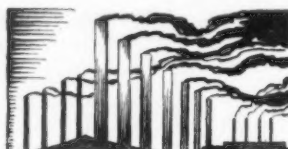
In view of the preceding, we may perhaps simplify our consideration of

minimum wage theory by assuming that we are dealing initially with a condition under which average real wages are established at just levels, and where relative wage rates, whether determined by collective bargaining or in a free labor market, represent with all practicable exactness, and with due allowance for variations in local conditions, the relative productive value to employers of different classes and groups of workers. We may assume, further, that minimum wage fixing, as such, may be considered to be a problem



apart from such emergency action as may be required to prevent the extremes of wage cutting during periods of abnormal business depression. And, finally, we may assume, as previously indicated, that any excesses of prices and of average rates of profit have been eliminated (as experience shows in the long run they must be) by competition or by public regulation, rather than by wage determinations.

Under these simplified assumptions, any sound solution of the problem of minimum wage fixing, whether by collective bargaining or by legislation, requires a determination of the ex-



tent to which it is economically practicable and socially desirable to give to certain of the lower paid groups a compensation in excess of their true productive value. Since we have assumed that excessive profits have already been eliminated, such increased compensation can have, separately or in combination, only three results, as follows:

1. To raise prices at the cost of lowered real wages for other workers.
2. To bring about forced increases in the productive value of the workers whose compensation is increased—i. e., usually through the introduction of labor-saving machinery.
3. To throw the least efficient of the minimum group into a permanently

or semi-permanently unemployable class.

Forcing the Issue of Unemployability

Among many of the advocates of minimum wage fixing, the preceding presentation of the case is accepted as a reasonable one. They agree that average real wages cannot be increased by arbitrary wage fixing. They recognize that the working groups of lowest efficiency cannot be paid "living wages" representing full support for an average family at standards of living determined by the earnings of much more efficient workers. They even admit that the ultimate and fundamental cure for extremely depressed wage levels must be sought very largely through preventing the breeding within, or importation into, this country of mental defectives and other classes of subnormal workers. But they argue, with entire truth, that wages increased from extremely low levels may tend in themselves to bring a substantial offset in the increased efficiency of normal workers. And they contend, furthermore, that, to such extent as reasonable increases in minimum wage rates may throw economically defective groups into a permanently or semi-permanently unemployable category, such segregation is socially desirable and should be met by public provision for special care and for the special training of those whose disabilities can be corrected.

Opinions may differ as to the complete soundness of this reasoning. It is possible to argue that, in the end, the socially more desirable procedure would be to take those steps necessary to secure the very substantial increases in *average* real wages which might come from the elimination of existing excessive costs of marketing and distribution, and to leave the question of relative wage rates to the ordinary processes of adjustment in the labor market.

The Workable Solution

Nevertheless, the problem of economic adjustments to social demands can very rarely be solved by the adoption of what is theoretically, or even practically, the most effective plan. The workable solution must usually be that one *within the limits of the economic practicalities*, which



comes nearest to satisfying any widespread popular sentiment. Furthermore, regardless of other factors, the attitude of the more progressive employers will be so solidly against the payment of those extremely low wage rates which have been current in some occupations, as to reinforce very strongly the demands of the general public.

These reasons for a receptive attitude on the part of employers toward reasonable and moderate steps in the way of minimum wage fixing may be supplemented by a consideration of the fact that the maximum cost of any properly conceived minimum wage plan should not result in burdens, on either consumers or the higher paid workers, in excess of, perhaps, one per cent of their real incomes. Such burden is well within the limits of the permissible price to pay for the sentimental satisfactions involved, regardless of possible more concrete social benefits.

If the question of minimum wages is approached from the preceding angle, the important problems are as to the general principles that should govern in practical applications.

The first requirement, perhaps, is that a clear distinction shall be made between true applications of minimum wage theory and attempts to force *general* increases in wage payments. It is only in very rare cases that any true application of the minimum wage principle will indicate the fixing of a minimum wage at more than two-thirds of the average wage actually current in the area and for the general class of workers involved. For example, a general class of workers might include female employees in all occupations below the rank of forewoman. Much of the minimum wage fixing of recent date appears to violate this principle. Attempts to fix minimum rates of pay at levels above two-thirds of the average for reasonably homogeneous groups of workers, seem in practice to be clearly outside of the range of true minimum wage fixing, and, in effect, to constitute arbitrary *general* wage increases with a related tendency to establish the *minimum* also as the *maximum* rates of pay.

A Supplemental Requirement

A supplemental requirement, directly related to the preceding, is



that locally abnormal minimum wage rates shall not be established in the attempt to secure a closer approach to equality of general wage scales in rural and urban areas, and in different sections of the country. It is socially desirable that the correction of these differences should come from the gradual extension of industry into rural and otherwise economically backward areas, even though the resulting lower costs of operation may create some temporary accentuation of competitive pressure within the in-



dustries involved. Such trend toward the location of manufacturing operations in rural and suburban areas is specially important in view of the apparent need for the transfer of a substantial fraction of our present farm population to industrial and other non-farming occupations—and it is clearly undesirable that it should be obstructed by minimum wage fixing of such extreme type as to constitute, in effect, a premature and arbitrary raising of wage levels in those areas where increased industrial employment is urgently needed.

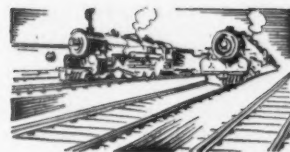
As the third requirement, it would appear that no single increase in min-



imum wage levels should exceed, perhaps, 20 per cent, and that such higher level, except for pro-rata changes with any general advance in wage rates, should not be further raised until adequate time has elapsed to make certain that the previous rates have not operated to bring about troublesome displacements of labor or in industry, or to create excessive groups of unemployables.

Below the Minimum

Closely related to the preceding is the fourth requirement that provision should be made, in each minimum wage determination, for the permanent employment at lower than the minimum wage of a definite percentage (say 10 per cent) of subnormal and superannuated workers.

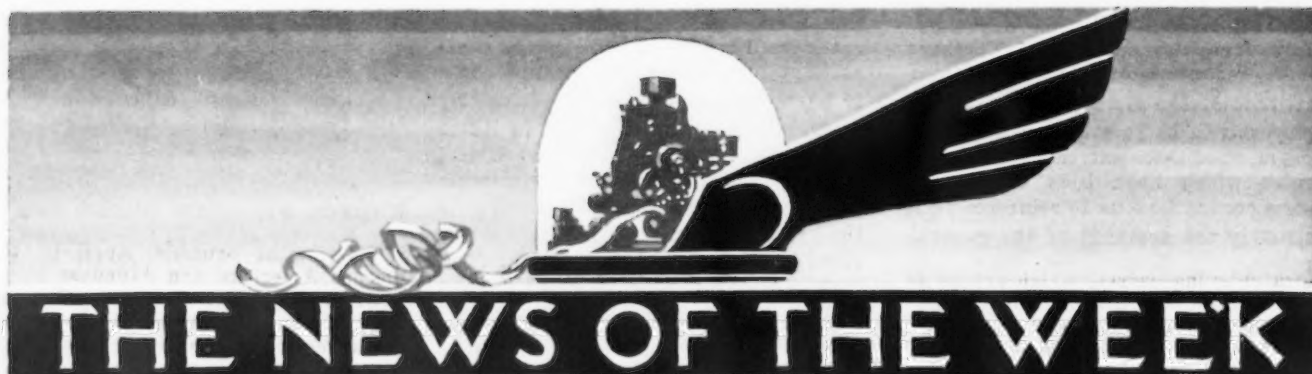


Whatever may be the ultimate social provision for subnormal or otherwise handicapped workers, and whatever success may attend efforts at special training, it seems clear that there will always be a substantial number of such workers who cannot earn even normal minimum wages, but who will, nevertheless, be better situated in some form of regular commercial employment than when limited to work under institutional care. The latter employment should very certainly be confined, so far as practicable, to those whose commercial employment would be hazardous or otherwise detrimental to normal workers, or who are wholly incapacitated for commercial occupations.

A program of minimum wage determinations subject to the foregoing principles should develop, in orderly course, all the essential possibilities of the minimum wage theory. It should, furthermore, be one to which progressive employers and trade associations could give full cooperation. And, finally, it should limit to a minimum the danger of creating large groups of unemployables and of wastefully and harmfully distorting the normal trends of industrial and commercial development.

The real problem of industry will not, however, lie in any difficulty in arriving at a workable compromise with the more reasonable believers in minimum wage theory—but in disassociating minimum wage practice from perversions of the minimum wage theory in justification of economically impracticable attempts to force *general* increases in wage levels.

The performance of a tubular air preheater used in connection with a 1600-hp. longitudinal drum boiler utilizing blast furnace gas was reported by R. D. Abbiss, assistant chief engineer of the Edgar Thomson Works of the Carnegie Steel Co., Braddock, Pa., to a heat-transfer session held during its annual meeting by the American Society of Mechanical Engineers. The preheater had a surface of 12,000 sq. ft. The waste gases entered at 633 deg. F. and left at 473 deg. The air going to the preheater averaged 87.2 deg. and the air leaving the preheater, 473 deg. The calculations showed a unit heat transmission of 523 B.t.u. per sq. ft. per hr., or about 2 B.t.u. per sq. ft. per hr. per deg. of temperature difference.



Steel Ingot Output Reaches 47.81 Per Cent of Industry's Capacity During March

MARCH production of Bessemer and open-hearth steel ingots amounted to 2,797,194 gross tons or 103,600 tons daily, according to the American Iron and Steel Institute. Engaging the industry's potential capacity at 47.81 per cent, the past month's output was nearly 27 per cent greater than February's when 2,213,569 tons was produced. The March daily rate, however, was only 12.3 per cent greater than that in February when steel was made at a rate of 92,232 tons daily. Production last month was the highest since August, 1933, when 2,900,611 tons was turned out in the same number of working days. In March, 1933, only 909,886 tons of steel was made or less than a third of the total for the same month this year.

In the first quarter steel ingot production totaled 7,007,660 tons or

89,842 tons daily, engaging potential ingot making capacity at 41.46 per cent. This compares with 3,026,828 tons in the first quarter of last year when the industry averaged only 39,309 tons daily or 18.08 per cent of capacity.

Employment in Steel Industry Still Rising

CONTINUED improvement in the iron and steel industry is reflected in the February report of hours and wages released by American Iron and Steel Institute. These figures, from 219 member companies of the iron and steel code, show the employment of 10,000 more workers during the month and a further increase in average hourly wages and in hours per week.

The total number of workers receiving hourly, piecework or tonnage wages in February was 365,305 as against 355,292 in January. The average hours per week per employee was increased from 29.2 to 31.9 in February, while the average hourly wage increased from 58.3c. to 58.7c.

This is the highest average hourly wage reported since the iron and steel code became effective last September. During that month, the average hourly wage was 56.7c. and it has shown a steady increase each month since. This figure will show a considerable jump in April as a result of the 10 per cent average increase granted by the steel industry to its workers which became effective April 1.

Based on the February total of wages paid, the latest wage increase will add over \$2,700,000 monthly to the steel industry's payrolls. Since June, 1933, aggregate wage increases in the industry have amounted to approximately 36 per cent. Total wages paid in February were \$27,394,221 against \$26,737,393 in January.

Revisions in Extras Announced by Institute

REVISONS in extras applying to a number of finished steel products were announced last week by the American Iron and Steel Institute which issued changes to be pasted in its booklet of uniform extras.

In the structural shape section (6) extras were revised slightly on wide flange shapes made by the Carnegie, Illinois and Bethlehem companies as well as on light beams and joists produced by the same interests. Minor changes were also made in the extras for chambering rolled beams.

In section 7 of the extra book, devoted to merchant bars, the wording in the division on straightening extras was changed slightly, such extras now being for "commercial machine straightening." In the same section, new extras for the rolling of hot-rolled steel bars to close tolerances were made applicable. "If closer than

PRODUCTION OF OPEN-HEARTH AND BESSEMER STEEL INGOTS (Gross Tons)

Reported for 1933 by Companies Which Made 96.57 Per Cent of 1932 Ingot Output

1933	Open-Hearth	Bessemer	Calculated Output All Companies		No. of Working Days	Per Cent Operation
			Monthly	Daily		
January	885,743	109,000	1,030,975	39,618	26	18.23
February	922,806	126,781	1,086,867	45,286	24	20.83
March	784,168	94,509	909,886	33,699	27	15.50
April	1,180,893	135,217	1,362,856	54,514	25	25.08
May	1,716,482	216,841	2,001,991	74,148	27	34.11
June	2,211,657	296,765	2,597,517	99,904	26	45.96
July	2,738,083	355,836	3,203,810	128,152	25	58.95
August	2,430,750	370,370	2,900,611	107,430	27	49.42
September	1,991,225	242,016	2,312,562	88,944	26	40.92
October	1,847,756	191,673	2,111,866	81,226	26	37.37
November	1,331,091	156,939	1,540,882	59,265	26	27.26
December	1,624,447	132,787	1,819,648	72,786	25	33.48
Twelve months...	19,665,101	2,428,734	22,878,571	73,801	310	33.95

Reported for 1934 by Companies Which Made 98.10 Per Cent of 1933 Ingot Output

1934	Open-Hearth	Bessemer	Monthly	Daily	No. of Working Days	Per Cent Operation
January	1,786,467	172,489	1,996,897	73,959	27	34.13
February	1,995,638	175,873	2,213,569	92,232	24	42.57
March	2,540,143	203,904	2,797,194	103,600	27	47.81
Three months...	6,322,248	552,266	7,007,660	89,842	78	41.46

The figures of "per cent of operation" are based on the annual capacity as of Dec. 31, 1932, of 67,386,130 gross tons for Bessemer and open-hearth steel ingots.

one-half of the present manufacturer's standard tolerances are specified and/or are required and can be so hot-rolled by a continuous operation," the extra is 25c. a 100 lb. "If closer than one-half of the present manufacturer's standard tolerances are specified and/or are required and the bars are processed after reheating, the extra is 40c. a 100 lb. The published pickling or commercial machine straightening extras, which extras do not include any cold working, either for surface conditioning or machinability are also to be charged on close tolerance hot-rolled bars.

The same extras and deductions applicable to tin plate and appearing in section 24 of the book of extras are now applicable to copper coated plate, effective March 15, 1934.

Quantity extras on drill steel, section 51, now apply "to three assorted sizes of a grade of either hollow or solid drill steel ordered at one time for shipment at one time."

A new section, 51a, has been added, establishing extras for size, finish, quantity, cutting and packing on internal combustion valve steel in rounds, squares, octagons and hexagons.

Section 52 has been revised by the deletion of the extra of 1/2c. a lb. for packing on both high speed and tungsten hack saw sheet steel.

Newport Rolling Mill Employees Strike

DEMANDING retraction of an alleged lay-off order to four members of the Amalgamated Association of Iron, Steel and Tin Workers, 900 employees of the Newport Rolling Mill Co., Newport, Ky., went on strike last week. A. K. Andrews, president of the company, denied that he had directed the lay-off of the four men.

The labor flare-up occurred following a meeting of employees, called for Wednesday by Mr. Andrews. At this meeting the four union members walked out of the meeting because others present were members of a company union. Following the meeting, Mr. Andrews gave instructions that one of the four union representatives was not to report for work the next night, but the rumor became prevalent that the four men had been ordered not to report for work. The meeting had been called to announce increases in wages for "tonnage" men following similar increases for "hour men."

Efforts are being made to arbitrate the dispute and the city manager of Newport has offered his services as arbitrator.

The Calumet Steel Co., Chicago, on April 15, will move its executive offices from 33 North La Salle Street to 20 North Wacker Drive.

British Steel Production Highest In Four Years — Demand Improving

LONDON, ENGLAND, April 10.—(By Cable)—Pig iron is more quiet, but home consumption is maintained and output is assured for months ahead. Exports are dull but some improvement is noticed.

Steel is more active, and production is the highest in four years. Current output of semi-finished is being sold and light structural steel is improving. Billet makers are heavily booked. Work on Cunard liner was resumed Tuesday, and further shipbuilding orders are expected. Tin plate is quiet, but fair export inquiries are in prospect and higher prices are probable in view of increasing costs.

The Continental iron and steel markets are quiet but the undertone is firm. Overseas markets are dull, except in Egypt, Morocco and Persian Gulf. The United Kingdom has placed orders for steel bars, billets and wire rods.

The Dutch and Scandinavian markets are livelier. The recent price increase on joists is not applicable to England,

British India, Japan, Manchuria, Sweden, Egypt and the United States.

The International Wire Export Co. is meeting at Brussels, April 10, to discuss American and Japanese competition. Negotiations for a French pig iron cartel are progressing and an agreement is expected soon entailing the fixing of minimum prices. French works have booked Russian order for 10,000 tons of steel tubes and are negotiating further contracts.

British Association to Open Foundry School

THE British Cast Iron Research Association and the English Board of Education have announced the establishment of a course to train promising men in the scientific principles underlying foundry problems in order to fit them for directive and other responsible posts. The new school is an independent unit located in Birmingham, England, and the instruction will cover all branches of ferrous and non-ferrous foundry work. The course consists of 1200 hr. of lectures and laboratory work, with visits to foundries at frequent intervals. Each of the 25 students furnishes \$150, the association supplies \$2,500, and the Board of Education contributes an additional \$7,500.

Scrap Institute Reports Rapid Growth

APPROXIMATELY 75 applications for membership in the Institute of Scrap Iron & Steel were received during February and March, representing an unusual increase in the firms and the tonnage of scrap iron represented by the institute, according to Benjamin Schwartz, director general. This increase is the largest for any similar period, since the founding of the institute in 1928, and is attributed to the code for the scrap iron and steel trade, which was recently approved.

National Steel Corp. Declares Dividend

NATIONAL STEEL CORPN., through its chairman, E. T. Weir, has announced declaration of its regular quarterly dividend of 25c. a share on 2,156,832 shares of common stock outstanding. The dividend is payable April 30 to stockholders of record April 20.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton			
Ferromanganese, export	\$9		
Billets, open-hrth. \$5 10s.		to \$5 12s.	6d.
Tin plate, per base box	16s.	6d. to	17s.
Steel bars, open-hearth	\$7 17 1/2s.	to \$8	7 1/2s.
Beams, open-hrth. \$7 7 1/2s.		to \$7 17 1/2s.	
Channels, open-hearth	\$7 12 1/2s.	to \$8	2 1/2s.
Angles, open-hearth	\$7 7 1/2s.	to \$7 17 1/2s.	
Black sheets, No. 24 gage	\$9 5s.		
Galvanized sheets, No. 24 gage	\$11 5s.	to \$11 15s.	

Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £			
Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.			
*Ingots	\$2 5s.		
*Billets, Thomas ..	\$2 7s.		
Wire rods, No. 5 B.W.G.	\$4 10s.		
*Steel bars, merchant	\$3 2s.	6d.	
*Sheet bars	\$2 8s.		
Plates, 1/4 in. and up	\$4 1s.	6d.	
*Plates, 3/16 in. and 5 mm.	\$4 3s.	6d.	
*Sheets, 1/8 in.	\$4 8s.	6d.	
*Ship plates	\$4 10s.		
*Beams, Thomas ..	\$2 19s.		
*Angles (Basic) ..	\$3 1s.	6d.	
Hoops and strip steel over 6-in. base	\$4		
Wire, plain, No. 8	\$5 7s.	6d.	
Wire nails	\$5 15s.		
Wire, barbed, 4-pt. No. 10 B.W.G. ..	\$8 15s.		

*Prices as established by European Raw Steel Cartel.

Management and Men Join in

By GILBERT L. LACHER

Managing Editor
The Iron Age

STEEL company executives and representatives of their employees expressed their unanimous opposition to the Wagner bill in hearings before the United States Senate Committee on Education and Labor at Washington April 5 and 6. Although the heads of some of the largest corporations in the country offered testimony, they by no means monopolized the spotlight. In fact, it would hardly be an exaggeration to say that the employee witnesses stole the show.

A total of 74 employee representatives appeared, of which 19 testified. The employee groups included delegations from the Bethlehem, Pa., works of Bethlehem Steel Co.; the Fore River plant of the Bethlehem Shipbuilding Corp., Quincy, Mass.; the Youngstown Sheet & Tube Co., Youngstown, Ohio; the American Rolling Mill Co., Middletown, Ohio; the Wheeling Steel Corp., Wheeling, W. Va.; the Republic Steel Corp., Youngstown; the Weirton Steel Co., Weirton, W. Va.; the Interlake Iron Corp., Toledo, Ohio; and from the following subsidiaries of the United States Steel Corp.: American Sheet & Tin Plate Co., Carnegie Steel Co.,

Oliver Iron Mining Co., Illinois Steel Co., Tennessee Coal, Iron & Railroad Co., and Lorain Steel Co.

Some of the employee witnesses were even more vehement in their opposition to the Wagner bill than the steel company executives. One of them became so earnest in his discussion of points raised by the examining committee that on several occasions he fired back questions at his questioners, much to the amusement of the chairman, Senator David I. Walsh of Massachusetts. Frequently the chairman asked employee witnesses what their earnings were and in one instance made the comment that they approached a Senatorial salary. In the testimony of Ernest T. Weir, chairman of the National Steel Corp., it was brought out that William Long, chief organizer at Weirton for the Amalgamated Association of Iron, Steel and Tin Plate Workers, averaged more than \$10 a day for every day he worked for the Weirton company in 1933 and had an average of as high as \$14 a day during 1928.

Both executives and employees condemned the Wagner bill for encouraging class conflict when the chief desire

of both sides is peace. There was a united protest against provisions of the bill that would prevent the continuance of normal and friendly relationships between management and men. There was strong opposition on the part of the men to the clause in the bill which would permit enforcement of the closed shop. Some of them former members of national unions, they saw no reason for undergoing the expense of paying dues to outside labor organizations when they were getting better results through employee representation with no cost to themselves. They emphatically denied that their organizations were influenced or dominated by their employers in any way.

Outside Unions Declared Superfluous

Said J. F. Madden, employee representative, Weirton Steel Co., "Any man who has had to pay out his good money to the Amalgamated, as I did for many years, can see how foolish it is when the NRA has developed a way for the working man to set up a form of organization for 'collective bargaining' which in my own case is getting quicker action in a much wider field of activity than can ever be possible through an outside agent of any labor union like the Amalgamated . . . Every fair-minded working man knows that through the NRA, President Roosevelt has made it possible for us to get something at no cost which, before the NRA, we had to buy with hard-earned dollars. The dollars paid by the working man for union membership give a lot of men 'soft' jobs and the man paying the dues can't do anything about it. Through fear and force the working man has been made to pay dues into one union or another.

"There is no coercion by the company at Weirton; the coercion is coming from a handful of Amalgamated men who are trying to get members by calling at the homes of workmen and scaring their women so the men will join the union to protect their homes and families. Coercion is coming from labor organizers who draw their 'soft' pay from the pockets of



ERNEST T. WEIR
Chairman, National Steel Corp.



FRANK PURNELL
President, Youngstown Sheet & Tube Co.



T. M. GIRDLER
Chairman and President, Republic Steel Corp.

Condemning the Wagner Bill

Steel Company Employees Share Spotlight with Executives

At Washington Hearing

the working men. I for one don't believe the President wants to see any laws passed which will take hard-earned dollars out of the pockets of the working man unless there is a sure return for each one of these dollars. The working man doesn't want to be forced into any union, not of his own choosing, and that's what I have against the Wagner bill."

Weirton Rates 16 Per Cent Above Union Scale

Mr. Madden denied that the Amalgamated association had any members to speak of at the Weirton plant prior to the organization drive of last year. He said that Weirton rates of pay had always been higher than the prevailing rates in mills having agreements with the Amalgamated union and that since April 1 they had been 16 per cent higher.

He said that many of the pledge cards obtained by the Amalgamated at Weirton Steel Co. plants were signed under duress. This, he stated, was proved by Mr. Long's own testimony before the National Labor Board to the effect that only 950 out of the Weirton company's 9000 employees had paid their initiation fees.

Pay for Employee Representatives Defended

The employee witnesses denied that the small amount paid employee representatives influenced them toward favoring the management at the expense of their constituents. Said Elwood H. Smith, chairman of the general body of employees' representatives at the Bethlehem Steel Co.:

"Our opponents hold that since employee representatives receive their regular wages while attending meetings, their freedom of action is thereby limited. This is not true, as we have been representatives for these many years and therefore know the absolute freedom with which any representative can discuss any questions and push them to an equitable adjustment with absolute freedom, and the committees can pass resolutions as they see fit.

"Our meetings deal largely with wages, hours, working conditions, safety measures, sanitation, efficiency of operating methods and similar matters for which work the employer would have to pay others if it were not handled by our representatives. Therefore I think we are entitled to reimbursement for time lost at work in order to attend meetings or to our representative duties."

On this same point J. M. Larkin, vice-president, Bethlehem Steel Co., said that it would be unfair to discriminate against employees by requiring that their meetings be held at their own expense. He added that some formal labor agreements which have Governmental sanction definitely stipulate that the employees' representatives be permitted to attend to their duties at the employer's expense.

"Business men have some common sense," declared Mr. Larkin. "They know that they cannot deceive their employees and at the same time preserve their loyalty and good will. No experienced management would attempt to establish a thoroughly dominated company union, with represen-

tatives picked out by them for the purpose of scenery. Nothing would be accomplished by such a set-up, and business men know it. They know that the representatives with whom they are to deal must truly represent the men. They know that if the plans are to operate effectively they must have the support and confidence of the employees."

Employee Representation a Method, Not a Union

Throughout the testimony it became evident that both the executives and the employees regarded the employee representation plan as a method and not as a union.

"They are not company unions or unions in any sense of the word," said T. M. Girdler, chairman and president, Republic Steel Corp. "These plans provide a method of collective bargaining on wages, hours and working conditions, between management and employees through their own elected representatives, and are so designed to provide a means for collective expression of opinion for negotiation."

Under cross-examination of various employee representatives it was



C. R. Hook
President, American
Rolling Mill Co.



A. H. YOUNG
Vice-President, United
States Steel Corp.



J. M. LARKIN
Vice-President Bethlehem
Steel Co.

brought out that the representation plans do not bar participation by union members, nor do they prevent a national union from gaining control of a works council if it succeeds in building up a large enough following. A representation plan is analogous to a legislature; the union and non-union adherents among employees are analogous to opposing political parties. But victory for a party in an employees' legislature does not force the defeated group to change its allegiance. Yet, according to the witnesses, that is what the Wagner bill would permit. It would be like forcing defeated Republicans to join the victorious Democratic party.

Answering a Stock Argument

One of the stock arguments of the proponents of national labor unions is that they give employees an opportunity to avail themselves of the skilled counsel of economists, representatives of national labor organizations, attorneys or any other agents, even though they are not employed in the plant. While most of the employee representation plans permit the election of anyone to office—even Mussolini as one man put it—Mr. Girdler took occasion to attack this union claim.

"I know something about the way labor unions work," he said, "and the business agents whom they put forward to deal with employers are certainly not economists or lawyers. The arguments which they use are not such as are found in books. They undoubtedly represent national labor organizations, but this is a disadvantage to the workers, as these business agents are acting under the direction of men who are much more interested in the development of their national organization than they are in solving the problems of any particular plant."

The preponderance of national interests to the detriment of local needs in an organized union was also touched upon by Charles Erickson, employee representative, Duquesne works, Carnegie Steel Co., who said, "We are not compelled to stop work in the event some nearby plant develops internal troubles over which we have no control or direct interest."

Present Union Structure Is Archaic

One of the strongest indictments of organized labor was made by Arthur H. Young, vice-president, United States Steel Corp., who pointed out that most national unions are craft associations, utterly unsuited to take the place of employee representation plans. He stated that if employees of the Steel Corporation subsidiaries were required, under the proposed legislation, to affiliate with existing national unions, they would have to join 38 separate organizations in the American Federation of Labor and 11

national trade unions outside of the A. F. of L. The lists follow:

WITHIN THE AMERICAN FEDERATION OF LABOR

International Union of Blacksmiths, Drop Forgers and Helpers.
International Brotherhood of Boiler Makers, Iron Ship Builders and Helpers.
International Union of Bricklayers, Masons and Plasterers.
United Brick and Clay Workers of America.

Experience vs. Theory

THOSE who testified against the Wagner bill were men actually employed in industry, either in the ranks of management or of the working force. Among those who have testified before the Senate committee for the bill not one has appeared as an employee or as an employer, declared Arthur H. Young, United States Steel Corp. The witnesses favorable to the measure included the following:

16 labor union officials
10 Government officials having to do with labor problems, ranging from a cabinet member and a United States Senator to members of NRA regional boards
6 college professors.

International Association of Bridge and Structural Iron Workers.
International Union of Building Service Operators.
Brotherhood of Railway Carmen of America.
United Brotherhood of Carpenters and Joiners of America.
Brotherhood of Railway Clerks.
Retail Clerks International Protective Association.
International Coopers Union of North America.
International Federation of Technical Engineers, Architects and Draftsmen's Unions.
International Brotherhood of Electrical Workers of America.
International Union of Operating Engineers.
International Brotherhood of Firemen and Oilers.
International Brotherhood of Foundry Employees.
Hod Carriers, Building and Common Laborers Union of America.
Hotel and Restaurant Employees and Beverage Dispensers International Alliance.
International Association of Machinists.
Amalgamated Association of Iron, Steel and Tin Workers.
Brotherhood of Maintenance of Way Employees.
National Organization of Masters, Mates and Pilots of America.
Amalgamated Meat Cutters and Butcher Workmen of America.
International Association of Sheet Metal Workers.
International Union of Mine, Mill and Smelter Workers.
United Mine Workers of America.

International Molders Union of North America.
Oil Field Gas Well and Refinery Workers of America.
Brotherhood of Painters, Decorators and Paper Hangers of America.
Pattern Makers League of North America.
Plumbers and Steam Fitters of the United States and Canada.
International Union of Metal Polishers.
International Union of Quarry Workers.
International Union of Seamen.
Switchmen's Union of North America.
International Brotherhood of Teamsters, Chauffeurs, Stablemen and Helpers.
Order of Railroad Telegraphers.
Telegraphers Union of North America.

OUTSIDE THE A. F. OF L.

Automobile Workers Industrial Union.
Amalgamated Society of Carpenters and Joiners.
Amalgamated Food Workers.
National Beneficial Association of Marine Engineers.
Marine Workers Industrial Union.
Mine, Oil and Smelter Workers Industrial Union.
Brotherhood of Railroad Trainmen.
American Federation of Railroad Workers.
Railroad Yardmasters of America.
Brotherhood of Railroad Signalmen of America.
American Train Despatchers Association.

This list takes no account of the multiplicity of departments, State branches and city central branches of the American Federation of Labor. This archaic structure is wholly out of harmony with modern industrial conditions. It would, as Mr. Young put it, lead to "overlapping confusion and jurisdictional disputes and yet leave wide gaps of coverage for thousands of employees for whom no unions are formed. And not all of our tradesmen are eligible to some of the unions listed, because of 'aristocracy' traditions and class and color distinctions prevailing in the unions."

Wage Policy of National Unions Antiquated

Besides being antiquated in organization, the national unions are out-of-date in their handling of wage rates, according to a number of witnesses that appeared. Standardization of wage rates is becoming more and more difficult, with the growing complexity of productive processes and the increasing variation in the character of individual duties. On this point Charles R. Hook, president, American Rolling Mill Co., said:

"The wage policy of the national labor unions with which I have had any experience has been antiquated and non-constructive. They depend on coercion to force the highest possible wage rates without due regard for individual skill, responsibility or the ability of industry to pay. Frequently, this condition leads to unfair wage treatment within the closed shop organization.

"To set wages on a fair and scientific basis requires not only an understanding of the economics of business, but long experience in rate setting. In our own company, we have established a fair wage plan which

required two years' study by men who have had years of experience in our industry. This plan recognizes the difference in skill between jobs, and compensation for each job is established in its relationship to others. This can be done only after a thorough, detailed study of every job in the plant. The cost of living in the community was taken into consideration, as well as a study of rates paid in competitive industries. Then the rates were referred back to the men themselves and adopted only after very careful conference and consideration. This is constructive collective bargaining."

Mr. Hook's remarks regarding national labor unions were based upon experience, as one department of his



NATHAN L. MILLER

Wagner Bill Is Obstructing Recovery — Nathan L. Miller

THE Wagner bill has been a decided check upon the upturn of business and its enactment would impose a very decided brake on the forces that are now unquestionably making for national recovery," declared Nathan L. Miller, ex-Governor of New York and general counsel for the United States Steel Corp., who appeared before the Senate Committee on Education and Labor at the request of the American Iron and Steel Institute.

He charged that such a law would encourage industrial strife and besides would be of doubtful validity. He added that the right of collective bargaining is now guaranteed workers under section 7a of the recovery act, and that further legislation is neither expedient nor in the public interest at this time because of the limited experience of the country under codes.

"The most earnest advocate certainly will not claim that we are beyond the experimental stage," he stated, and cited the President's interpretation of section 7a in the automobile labor crisis as being in the true interests of satisfactory human relations in industry.

"That, gentlemen, is the only sound basis upon which to secure industrial peace," he added. "As I read the proposed measure, it is based on an exactly contrary principle to that enunciated by the President. . . .

"I think no one can doubt that this measure has within it the seeds of the most serious industrial conflicts. It offers encouragement to industrial conflict."

Referring to the claim that the bill is intended to free labor, he declared that its provisions defeat that purpose.

"Its provisions are aimed wholly against the employer. If there are cases of intimidation or coercion or discrimination, the present law provides not only the prohibitions but it provides a remedy. Until that remedy is tested, there is no need for further legislation."

He stated that employers generally are prepared to accept the President's interpretation of section 7a and to have it enforced under the NRA on that basis. Discrimination on the basis of affiliation, or non-affiliation with a labor union, he pointed out, is specifically prohibited by 7a.

"No responsible management in this day would dare to exercise coercion or intimidation over men representing their fellow workers. Employers as a whole have recognized the principle of collective bargaining. What is really meant by refusal to bargain collectively is re-

company worked under an agreement with the Amalgamated association for some 28 years.

"The local lodge of the Amalgamated association," he said, "had what was known as a 'mill committee' but I soon found that this mill committee was nothing but a grievance committee. It operated only when, as and if there was a grievance."

In 1929 a continuous sheet mill was installed at Middletown, entirely changing the manufacturing processes. "In June of that year an agreement had been prepared and submitted to the sheet mill men. It was finally adopted and signed by the advisory committee of that department, as at that time no one, including the Amalgamated officials themselves,

fusal to deal with outside labor organizations. This bill seeks to compel that very thing."

Intimidation and coercion, he declared, are on the other side, and cited testimony of a Weirton Steel Co. employee who had been prevented from entering the plant by threats of union sympathizers. Much of the intimidation practiced by organized labor, he asserted, is of a kind from which an injunction would give no protection. And yet existing law exempts both labor unions and officials of responsibility for all acts of agents or officers of unions unless it can be proved that such acts were specifically ratified by them.

Governor Miller emphatically denied that there is such a thing as a "company-dominated" union. "One could not exist for any length of time. Do you think that you could make these workers content if their representatives were tools of management? Don't you think they would find it out? Any company that undertakes to dominate is bound to meet with defeat, and worse than that."

He declared that the Wagner bill would clothe the National Labor Board with such great powers, both judicial and executive, that its membership should represent one interest alone, the public interest. And a body with such great powers should, he asserted, have a procedure that at least approximates due process of law. The provision for judicial review is a farce, he stated. A board of this type, he asserted, should be subjected to the broadest judicial review, not only as to the sufficiency of evidence but also as to the quality of evidence.

Charging that the principles in the Wagner bill were generalized from extremely limited experience and extremely limited knowledge of industrial conditions, Governor Miller cited the testimony of the steel company employees and executives as coming from men who have been spending their lives in daily contact with the industrial relations problem and who necessarily have a far better understanding of its complexity and delicacy than those who have been administering section 7a for the past six months.

He deprecated the old conception of employers and employees as being in opposing camps. Management today is made up of hired hands just like workers. The pay of both comes out of the same envelope; workmen are on the same plane with management and they know it, he said.

was able to write a scale adaptable to the new process. Officials of the Amalgamated association were present when the new agreement made direct with our men was signed. Some sixty days after the new plan had been in successful operation, those officials returned to Middletown and endeavored to get the workers in that department to abrogate their agreement, which they refused to do. On the eighteenth day of September the national officials of the Amalgamated association ordered the men to strike and to their everlasting credit be it said, the men were faithful to their trust and refused to go out . . . Of 690 men then employed, only 37 failed to be at their post at their appointed time. . . . Not one minute's time or one ton of production was lost, although every method of abuse and coercion known to the professional union organizer was used to get these men to break their agreement and leave their jobs."

All Forms of Company-Sponsored Social Service Barred

Besides opening the way for domination of employees by professional union leaders, the Wagner bill, it was charged, would prevent all of the associated activities of mutual benefit to management and men which have grown up in connection with employee representation plans.

Said Frank Purnell, president, Youngstown Sheet & Tube Co., "If the Wagner bill were enacted, it is doubtful if the representation plan could be continued because the company would have to become entirely dissociated from it and treat it as a stranger." During the years of the operation of the Youngstown plan, he declared, many incidental benefits have been enjoyed by employees, including extended credit, employees' gardens, formation of a mortgage bureau in the chamber of commerce to protect employees' homes, appearance by attorneys in the claim department of the company in courts to protect employees from garnishments, attachments and other forms of oppression, the cooperation of the company in the amendment of the garnishment laws for the benefit and protection of employees, the building and sale to employees of homes at cost, and employee operation of company-financed stores where provisions and other articles are sold at cost.

Mr. Purnell was of the opinion that these moves of the company to assist its employees would be branded as unfair labor practices under the Wagner bill. A number of employee witnesses testified to the great help they had received during the depression through company-financed stores, not only from the lower prices that prevailed but from the liberal extension of credit.

Preservation of the rights of the individual was stressed as a strong point of representation plans by sev-

eral witnesses. Said William Conn, employee representative, Weirton Steel Co.: "Under the national labor union plan the individual is completely lost sight of, whereas under our representative plan both the mass of employees and the individual can have cases passed upon and argued before the management either as an individual or collectively."

Emphasizing the close cooperation between men and management possible under employee representation, Charles Erickson, representative, Duquesne works, Carnegie Steel Co., said: "Satisfactory settlements of many problems are brought about through direct contact with the management, and with the least possible trouble to all concerned . . . Employee representation is ready at an instant's notice to clear up minor troubles. It is free from racketeering and petty politics, a condition too often found in outside representation . . . The men normally at the head of local labor organizations are not, and can not be, as familiar with our working conditions as the representatives now chosen by us."

Bill Aims to Turn Industry Over to A. F. of L.

Mr. Girdler, head of Republic Steel Corp., charged that the Wagner bill was an attempt to turn industry over to the American Federation of Labor.

The bill, he said, "authorizes the United States courts to issue injunctions to restrain acts of employers as defined in Section 5, but no provision is made for issuing injunctions against labor unions. I am told that under the Norris-La Guardia anti-injunction law the right of employers to secure injunctions against unfair acts by labor unions has been denied. If you are going to deal fairly with this subject I should think the same rights and remedies should be given to both sides."

"There are six clauses in Section 5, all important, declaring what shall constitute unfair labor practices by employers. This section is intended to compel employers to recognize and deal exclusively with the American Federation of Labor. It destroys employee representation plans or any other plan in which employer and employees have mutual interest."

Would Incite Constant Controversy

"Finally, it is declared to be an unfair practice for employers to—

engage in any discriminatory practice as to wage or hour differentials, advancement, demotion, higher tenure of employment, reinstatement, or any other condition of employment, which encourages membership or non-membership in any labor organization."

"Under this clause practically every change made in the work of a plant employee becomes immediately a disputed question if he is a member of a labor union. No matter how strongly

the employer may testify that such changes were made solely according to the merit or demerit of the worker, we must expect a controversy, and under the provisions of this bill creating a National Labor Board, with its principal office in Washington, we are subject to be called there at substantial expense and inconvenience for the determination of a question which any experienced plant superintendent could dispose of fairly, satisfactorily and promptly under the present system."

How Employees "Flock" to the A. F. of L.

"I am told that speakers in favor of the bill have undertaken to convince you that the workers themselves resent the employee representation plan and have flocked to the American Federation of Labor, requesting to be taken into that organization. This is absolutely untrue, as far as we are concerned."

"The facts are that promptly upon the enactment of the National Recovery Act the American Federation of Labor deluged the country with paid professional organizers whose duty it was to set up organizations in places where the American Federation of Labor had not obtained a footing. At our iron mine in Alabama, there had never been, prior to the enactment of the National Recovery Act, any union at all. The employees' representation plan was adopted with enthusiasm by the men and functioned successfully. Several months later the representative of the American Federation of Labor in charge of the Southern district, who resides at Atlanta, Ga., appeared at Birmingham and employed a local lawyer and others as organizers in behalf of the American Federation of Labor. They launched an intensive campaign for the purpose of creating a local union to be affiliated with the American Federation of Labor and used all the tactics usually employed in inducing employees to join that local union. Then these professional organizers claimed to be the representatives of the men and requested that the company disregard the representatives who had been previously chosen by secret ballot by the workers themselves. Since then we have had nothing but trouble. The sole issue is as to the recognition of the union. There is no other controversy worth mentioning."

"This case is typical and illustrates my statement that union leaders were not called in by the employees. . .

What Dues Mean to the Worker and the A. F. of L.

"I can readily understand the efforts of the leaders of the great national unions to seize this opportunity to try to unionize industry. The National Recovery Act has accustomed the people to expect great changes in the way of doing business, and the

current labor strife and unrest present just the condition in which such activities thrive. The American Federation of Labor has a tremendous incentive to carry on this propaganda. The annual revenue to be derived from union dues, even when paid at the rate of \$1 per month, reaches large totals. For every million men which can be enrolled in these organizations, they will receive, if all are paying dues, \$10,000,000 to \$12,000,000. Mr. William Green has told this committee that the present membership of the American Federation of Labor is in excess of 3,000,000 (Transcript 258). This would mean an income of \$36,000,000 each year. No political party in this country ever had such an annual revenue with which to build up and maintain its organization.

"Just a word more about collecting dues. If the workers are so anxious to join the American Federation of Labor, why should it be necessary for these unions to obtain a compulsory check-off to enforce collection of dues? And yet that is always one of the vital issues in every labor controversy. I know from experience that the great majority do not want to pay union dues, and will not do so except under coercion. Our plant workers are intelligent. They know that these dues reach large amounts, and they have a pretty good idea as to who is getting the most benefit from them, even though an accounting is seldom, if ever, published by the union."

Bill Imposes Impossible Burdens on Management

The inequitable features of the bill and the impossible demands for records which it authorizes the National Labor Board or its agents to make upon employers were emphasized by Mr. Weir.

"The board may make orders operating upon the employer, it may assess penalties against him and order the reinstatement of employees and yet it has no power to restrain the union, assess damages against it, or, in any manner, punish the union for its acts. What sort of justice would this be? . . .

"The provisions of this bill will permit the labor board to hold an election at any time that it finds a substantial number of employees who want an election. In political or corporate matters we are accustomed to thinking of an election as something coming at a scheduled time, the results of which determine the persons in power for a definite length of time, yet the industrialist is to be left in a situation where an election can be called at any time.

"The efficiency and productivity of a mill inevitably goes down when there are periods of excitement, contention or strife . . . Suppose the employees of a plant are about evenly divided in their allegiance. There will always be a substantial number requesting a new election and the min-

ute an election is over those defeated will constitute a substantial number who would like to see a new election called. No matter how vexing or harassing the labor board might be in this matter, the employer is left without any help, as no court has any right to enjoin the board. If we shut down a mill and open another, someone will claim that the mill was closed down because it had a greater percentage of union labor than the mill which was opened up. Every discharged employee can claim that he was discharged on account of his union activities and every such complaint, no matter how trivial, can be filed with the labor board at Washington and require an answer and hearing.

Extreme Powers to Demand Records

"One of the provisions of the bill enables not only every member of the board, but any agent of the board to call upon any employer for any records or papers he deems necessary. I want to give you an example of what was asked of us in connection with the investigation of our case. We were served with written notice demanding the production of various papers and records. There were ten items in the list, including records of correspondence, expenditures, reports, and papers. I just want to call your attention to four of the items that were asked of us. We were asked to produce our papers and statistics showing the system for distribution of employment monthly for the past five years. We were also asked to produce monthly records for the past five years as to new employment, discharges, lay-offs and shut-downs, with list and identification and classification of all persons employed, discharged or laid off since Sept. 1, 1933.

"Each mill and plant hires its own men. A man may work a few days a week, then be off a few days, and a record is made of that in loose-leaf form, which record is sent to the office for filing. To have produced the records required of us would have taken the services of several clerks for a month or more and it would have required a truck to convey them. We were also asked to produce records of the general volume of the business in tonnage and value and the sources and volume and value of the raw materials utilized.

"When one is served with a court subpoena requiring the production of papers, he has the opportunity to go before the court and have it determined whether or not the papers are necessary and at whose expense they are to be produced. In the Federal courts, I believe, it requires an order of court to require the production of papers, but this bill would enable any clerk or agent of the board to demand any records that he thought he needed, irrespective of the cost or expense involved, and bring them to Washington or any other place where

the agent desired them . . . When such records are demanded in income tax matters and Federal Trade matters it can be said of the demands at least that they concern some item of major importance, but under this legislation an employer could be subjected to the annoyance of such demands on the complaint of a single discharged employee, and that complaint need not be in writing or formal. It may be merely rumor or suspicion."

Contradicts William Green

Mr. Weir vigorously denied the charges made before the committee by Mr. Green that families were starving in Weirton because of the company's attitude toward labor. Statistics gathered by Mr. Weir from the Federal Unemployment Agency and the CWA for the district in which Weirton is located show a total of 455 unemployed persons. Of these, 154 were employees of other companies, 67 were young men who had never been employed, and 234 claimed to have been former Weirton employees. Of the latter, 123 left the company's employ before Sept. 1, 1933, some of them as long ago as 1916, leaving 111 now unemployed who claim to have been employed by the company prior to the strike. Twenty-two of the 111 have been reemployed, leaving 89, of whom 43 had less than eight months' service with the company, some of them as short a time as two days.

The witness submitted in evidence an editorial on Mr. Green's charges, published in the *Wheeling News*, which is most emphatic in denying their truth.

"There are no idle men in or about Weirton who cannot get work if they want work," said the newspaper. "There are no families starving. There is no want in Weirton. As a matter of fact, the CWA allotment for Weirton has not been used, and there is no indication that it will be used."

Weirton Employee Condemns Conduct of Labor Board

Jack Larkin, general chairman of the employee representatives of the Weirton Steel Co., vigorously attacked the conduct of the National Labor Board during and following the strike of last fall. His testimony, in part, was as follows:

"On Sept. 26, 1933, a small group of men calling themselves members of the Amalgamated Association of Iron, Steel and Tin Workers called a strike in one department of the tin mill. Within 24 hr. all the gates of the mills were closed. No demand had been made on the management so far as we know, and there were no complaints about wages or hours. There was intense indignation on the part of the great mass of the employees that they were being prevented from working by a small group of Amalgamated members and their

organizers. Later the steel company appeared before the National Labor Board in answer to a complaint of the strikers. Although I had previously sent a telegram to Senator Wagner, advising him that I was a representative of the employees, and had received a reply from him, neither myself nor any other employees' representative was summoned to Washington, and we were not present at the hearing.

"At the hearing Mr. Weir agreed, on behalf of the company, that representatives of the National Labor Board might supervise the next regular election, which was to be held the second week of December. The representatives did not approve of this plan because they had not been in on the hearing at Washington, but did amend the rules to provide for supervision by the National Labor Board, and sent Senator Wagner a letter, asking that a representative be sent. No reply was received for two weeks, and the rules committee decided to go ahead with the election according to its own rules and by-laws. Finally a representative of the labor board called and proposed a system of nominating by petition, instead of by secret ballot. The employee representatives were unanimously opposed to this. This is a vicious and un-American system. Those who sign a petition are subject to intimidation, coercion or reprisals. The 49 elected representatives were unanimously opposed to it. Finally we were summoned to Washington for a hearing before the labor board, at which hearing the labor board attempted to make us change our rules. We took the position that we represented a large majority of our employees and had a right to adopt our own form of organization and would not accept nominations by petition. Senator Wagner, in the hearing before the labor board, threatened to send me to jail for defying, as he said, the Government of the United States.

"It was obvious that the labor board was prejudiced in favor of union labor. While I was speaking before the labor board, Mr. Green asked me how many men worked the first day the mill opened. I told him 50 per cent. He asked me if I was one of them. I answered, yes. I was then publicly ridiculed by him. He said: 'You should be ashamed of yourself to go back on your fellowmen like that.' This brought applause and laughter. I answered him in this manner: 'I thought I came before a fair board, but you are not fair, Mr. Green.'

"We posted the rules for the election according to our by-laws a week before the election and sent a copy to the labor board. We heard nothing further from them. The election was scheduled to begin Sunday night at midnight, as we work in three shifts and the first crew comes on at midnight on Sunday. Saturday after-

noon, about three o'clock, the company received a set of rules from the labor board, with instructions to post them in the mills. These rules were entirely different from the rules of our organization. They provided for nominations by petition, as well as by ballot, a silly and unworkable scheme. It would have permitted a man's name to be put upon ballot by a petition signed by ten persons, and to thereby displace the name of some other man who had waged an active campaign and received a large number of votes. The competition for employee representatives in our organization was very keen. Imagine the situation of a man who had made an aggressive campaign and received two or three hundred votes, and then have him crowded off the ballot by somebody who was nominated by a petition signed by ten men who might have been the same men who voted at the primary and whose signatures might have been obtained to the petition by coercion or in ignorance.

"Besides that, the rules laid down by the labor board provided for 98 representatives instead of 49. In other words, it doubled the number of representatives from every mill. Take, for example, our strip mill, where the by-laws provide for 11 representatives. Campaigns had been going on for weeks and various slates had been formed, each upon the assumption that there were 11 representatives to be elected, and on Saturday afternoon, about 30 hr. before voting was to start, comes a set of rules from the labor board, directing 22 instead of 11 persons to be chosen from that mill. Why, if the steel company had posted those notices in the mill that day, there would have been a riot, and I do not blame them for refusing to post such notices. We still invited the labor board to supervise the election under our own rules, and it failed to do so. We went ahead and held the election. Over 83 per cent of all the eligible employees voted, and the total vote was equal to 98 per cent of the men who were at work in the mills that day.

Charges Connivance With Unions

"I understand Senator Wagner claims that the Weirton Steel Co. broke its contract with the labor board. My view, and I think it is the view of the vast majority of our employees, is that the labor board's conduct in the matter was shameful and a disgrace to the Government. The 49 representatives chosen at that election are functioning as the representatives of the men, and there is very little dissatisfaction with them. The men who are stirring up trouble, going to Washington and making extravagant charges, represent a very small minority of our employees. They call mass meetings from time to time, many of which have less than a hundred in attendance, and some of those are not employees.

"Just recently the labor board sent a man to Weirton to make reports on the labor situation there, and that man turned out to be a former organizer for the Amalgamated association, and he is still a member of the association. All through our controversy the union agitators were in direct touch with the labor board and often received advance information as to what the labor board was going to do. Is it any wonder that we had no confidence in the labor board as a fair and impartial court? In my opinion, Senator Wagner's bill is wholly designed to force unions upon the workers of this country because he has failed in those efforts through the labor board as it is now constituted, and the workers at Weirton are vigorously opposed to it."

▲▲ OBITUARY ▲▲

GEORGE F. ALDERDICE, president of the Commercial Shearing & Stamping Co., Youngstown, died at a hospital in that city on April 5, aged 58 years. His first connection with the steel industry was in the mechanical department of the Upper Union mills of the Carnegie Steel Co. He was later transferred to the operating department of the Park Steel Co., and subsequently to the general offices of the company. At the time of the absorption of the Park Steel Co. by the Crucible Steel Co., Mr. Alderdice was named assistant to the general auditor and was later promoted to the general sales managership. He became associated with the old Republic Iron & Steel Co., in 1910, as assistant to the vice-president at Pittsburgh, then district sales manager at St. Louis and finally assistant general manager of sales. He associated himself with the Brier Hill Steel Co. as assistant to the president in 1915 and later was made vice-president.

♦ ♦ ♦

NOBLE C. HARRISON, for 32 years associated with the John A. Roebeling's Sons Co., Trenton, N. J., died in the Osteopathic Hospital, Philadelphia, on April 4. Mr. Harrison had been intimately connected with the sale of wire rope during the entire time of his service with the company.

♦ ♦ ♦

PASCAL PRATT BEALS, former partner in the firm of Beals & Co., which later became Beals, McCarthy & Rogers, died April 4 in his Buffalo home. He was 83 years of age. Mr. Beals entered the steel warehousing business after his graduation from Yale in the class of 1872. Upon the death of his father, Edward P. Beals, president of the concern in 1903, he became a full partner in the company. He continued active in the affairs of the company until about 20 years ago when he retired.



THIS WEEK IN WASHINGTON

NRA Hits Code Violators and Price-Upping

Broad Reorganization of NRA Paves Way For Compliance Enforcement

WASHINGTON, April 10.—Widespread moves were instituted simultaneously last Saturday against code violators and high prices. The code violations generally appear to be in the nature of price chiseling, and the two steps taken at precisely the same time created some confusion. General Johnson, making good on his enforcement warning at the recent meeting of code authorities, instructed State compliance directors, code authorities and local compliance boards to take their cases directly to United States district attorneys. He informed them that 10 days after his order they are to take clear case violations to the Federal attorneys instead of first seeking advice from Washington.

The effort to keep a check on prices was announced by Frank C. Walker, National Emergency Council director. This task is to take on broad proportions. The plan calls for setting up about 120 volunteer experimental consumer councils under the auspices of NEC, to be in charge of Mrs. Mary H. Rumsey, chairman of the Consumers' Advisory Board of NRA. Heading the staff to conduct the new price investigation is Dexter M. Keezer, economist and former professor at Dartmouth. He has resigned as executive director of the Consumers' Advisory Board to take up his broader activities and has been joined by Dr. Frederic C. Howe, head of the consumers division of the AAA.

Moves in Contrast

The two moves are of a contrasting character, though obviously there can be violators both in the way of undercutting prices and of unduly boosting them. Nevertheless the steps taken added to growing confusion over NRA policies. The move against unduly rising prices plainly is a discernibly

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increasing discontent on the part of the public. It was made manifest at the recent public meeting staged by NRA and has gained volume since that time. It has been reflected by the Consumers' Advisory Board and, regardless of its merits, criticism has been directed toward General Johnson with growing force for his alleged indifference to the consumers' interest. Dr. Keezer himself has made such criticism and has shared prominently with consumers' representatives both in the NRA and the AAA in attacking price fixing in codes.

The allegation that General Johnson is not sufficiently sympathetic with the consumer appears wide of the mark. As a matter of fact he has from the start of his administration warned against undue price increases. His original theory was to increase employment and wages and let prices remain unchanged as a means of increasing consumers' purchasing power. The consumer actually was the key to the depression log, in his creed, for the simple reason that the consumer represents purchasing power and unless it was increased the jam could not be broken.

Employers have directed criticism at General Johnson from an angle entirely opposite to that taken by consumer representatives—using the term "consumer" in its more accepted sense, rather than in its technical sense. They have protested that increasing employment and wages and reducing work hours without increasing prices flies in the face of both economics and possibilities. Nevertheless much was done in that direc-

tion and much still is being done, even though price rises with wage increases, accompanied frequently with reduced hours, are becoming more common. There are many industries, however, which have strained themselves as matters stand and this has perceptibly slowed up the administration proposal for reducing hours and increasing wages.

Broad Reorganization of NRA

The most important development of this week in Washington, from the recovery standpoint, is the broad reorganization of the NRA. This was announced Tuesday morning, officially, although the intention has been known for some time, namely to shape the recovery organization for its second phase of activity; enforcement of code compliance.

In effect, the reorganization is a decentralization which is intended to confer authority upon subordinate officials of NRA and relieve General Johnson of detail. A centralized organization was needed for code making, inasmuch as as code making was centralized in Washington. Now that the codes have been made and put into effect, the centers of control must be widely distributed.

Personal and administrative staffs are created with full authority and responsibility for decisions.

A West Point classmate of Gen. Johnson, Lieutenant Colonel George A. Lynch, regarded by the general as "the most advanced thinker in the Army," is made "administrative officer" to approve all smaller codes, to run the entire office organization and "act on all matters not otherwise assigned which do not require the Administrator's personal attention."

Colonel Lynch, is an infantry officer recently on staff duty at Governor's Island, N. Y. He once was in command of the Legation guard at Pekin,

and recently in charge of collection of information for the Army War College in Washington.

With Colonel Lynch on the administrative staff are:

W. A. Harriman, "Special Assistant Administrator," responsible for selection of executive personnel, administration members of code authorities, and for co-ordination of the work of the seven industrial divisions which control the codes directly.

Alvin Brown, "review officer" who will review all documents on which General Johnson must act and pass on all final decisions of division heads to assure consistency with approved policy.

Donald R. Richberg, who will be personal legal adviser to Johnson and also supervise all NRA legal policies. Leon Henderson "economic adviser" personally to Johnson and responsible for all economic policy of NRA.

George Buckley, who is in charge of the division handling newspaper, printing and publishing codes, also is a member of the administrative staff and will devote part of his time to assisting William V. Lawson in charge of the press section of NRA.

The personal staff, consisting of Colonel Robert W. Lea, assistant administrator for industry; Edward F. McGrady, assistant administrator for labor; Miss Frances Robinson, assistant to the administrator, and Kilbourne Johnston, General Johnson's son and aide to the administrator, are to be responsible directly to him and are to work on such assignments and tasks as he may give them.

Comptroller Upholds President

General Johnson's enforcement order followed soon after a ruling by Comptroller General McCarl sustaining the executive order recently issued by President Roosevelt which requires bidders on Government contracts to produce certificates of compliance before being allowed to sell to the Government. Recent court decisions upholding NRA activities also appear to have prompted the determination of General Johnson for a general move toward enforcement. But he proposes that State compliance directors, code authorities and local compliance boards shall have clean-cut cases before acting. They are to send all such cases to the recently enlarged NRA litigation staff. The staff will sift what it considers the best cases and return them for action in Federal courts in districts where violations are alleged to have taken place. It gives industries, through code authorities, a wide opportunity to test their own ability for self-government.

Consumer Councils Experimental

The consumer councils, in their onslaughts against undue price kiting—if "undue" can be reduced to a common meaning—will be established on

an experimental basis. The extent of their activities are is known. However, it is understood that the Consumers' Advisory Board is keeping a close check on manufacturers' prices, noting rising levels in steel, automobiles, etc. The automobile industry several weeks ago announced increased wages and shortened hours. The steel industry subsequently announced wage increases.

Price Advances Opposed

The fact remains, however, that rising prices are a source of disturbance in Administration circles, or at least a portion of them. There are conflicting views among different Government branches and even within Government branches. Almost as much can be said for industry. For Washington is receiving reports plainly indicating industries are not in complete accord with regard to rising prices. There are some which feel that the more efficient units are being made to suffer a loss of business to less efficient, partly because of price policies and also because of restrictive requirements of the NRA itself. In the automobile industry Henry Ford has not gone along with other units and is maintaining old prices. What this holdout may mean in a competitive way is a matter of considerable interest because it is doubted that competitors will long care to take a chance on losing business to the Ford company because of a wider divergence in price levels. At the same time increasing wages and shortening hours or simply increasing wages—under present conditions—without shortening hours and then holding prices unchanged is held by many manufacturers to be suicidal.

Vertical Industries Encouraged

While Ford's move to offset rising costs by making his own steel may not be an index to a general move, it has set up speculation as to the prospect of building up vertical industries. Such action, it is argued, is encouraged by price rises, which appear to be enforced by code requirements for minimum wages and hours on the one hand and to be opposed on the other hand by attacks from the consumers' board and the Recovery Review Board of the NRA, the Federal Trade Commission and the general public. The removal by the recovery act of anti-trust restrictions, it has been pointed out, is an aid to vertical industries. The subject was also the matter of an observation by Doctor Nystrom, marketing expert, who has said that many manufacturers are "likely to extend their activities back into the production of raw materials and many of the large trading companies are now almost certain to become manufacturers on a large scale."

The price question is thus a complicated one and is shot through with cross currents. The NRA's general policy now is to prevent what industry

considers necessary price stabilization. It calls for the immediate effectiveness of prices upon being filed, thus doing away with the waiting period. This and other policies marking undesirable changes for industries have undoubtedly cooled them toward NRA. Constant attacks on industries, such as the Federal Trade Commission tirade in its recent report on the steel code, also have had a chilling effect. Heaped on this also are the labor disputes and proposed restrictive legislation.

February Commerce Statistics Show Gains

WASHINGTON, April 10.—February statistics on various metal products collected by the Department of Commerce generally showed improvement over the preceding month as well as over the corresponding month of 1933.

New orders for commercial steel castings received by 164 firms amounted to 35,698 net tons, compared with 26,296 tons in January, and with 13,179 tons in February, 1933. Production was also higher, having totaled 28,526 tons in February, 27,644 tons in January, and only 13,802 tons in February of last year.

The 112 makers of malleable castings reporting to the department booked orders for 36,594 net tons in February, compared with 32,501 tons in January and 11,273 tons in February of last year. Production in the same periods was 33,939 tons, 30,417 tons and 13,780 tons respectively, while shipments rose to 31,412 tons in February, 1934, as compared with 26,642 tons in January, and 14,215 tons in February, 1933.

New orders for fabricated steel plate in February reported by 46 identical manufacturers were 14,944 tons, compared with 15,308 tons in January, and 16,706 tons in February, 1933.

Britain Imposes Duty On Steel Drums

WASHINGTON, April 10. — A treasury order, effective March 29, imposed a duty of one-half pence (approximately 1c.) a lb., or 20 per cent ad valorem, whichever returns the higher rate, on iron and steel barrels and drums of a capacity of one gallon or more when imported into the United Kingdom from sources outside the British Empire, according to a cablegram received by the Department of Commerce from Lynn W. Meekins, commercial attaché, London. With the exception of the Irish Free State, such imports are free of duty when coming from within the British Empire.

Steel Warehouse Code Heard

Objections Raised To Practices Patterned After Steel Code— Modification Likely—Other Codes Heard and Amended

WASHINGTON, April 10.—Hearing on the code for the steel warehousing trade was held last week before P. S. Alexander, technical adviser, who, as acting deputy administrator, found it necessary to call a number of post-conferences in order to iron out differences that developed. The code was the object of considerable attack from NRA advisers and importing interests. Criticism coming from NRA sources was a reflection of the growing tendency to modify policies regarding such matters as the open price system, code authority selection, and narrowing of wage differentials between the South and the North.

Points made by NRA advisers indicated that surprising attention has been given to the attack made by the Federal Trade Commission on the steel code. It might be inferred that certain people are of the opinion that the steel code might be reopened and considerably revised. Numerous features of the steel code which were the object of the commission's wrath were mentioned at the hearing on the warehouse code since its prices are built upon the mill prices which in turn are set up under the much attacked basing point system. Questions directed at steel jobbers indicated the belief that this method of making prices together with other provisions of the steel code might be done away with by the NRA. Necessarily such a turn would mean modification of the warehouse code itself.

Steel Code Not To Be Reopened

The fact remains, however, that General Johnson has said he would not reopen the steel code on account of the commission report. Moreover, he plainly has resented the commission's attack on the steel code and has announced that he will make a reply to the attack. At the same time he said he was not satisfied with the steel code "by any means," but pointed out that, like other codes, it is experimental and is always subject to revision.

Warehouse Code Representative

The warehouse code was presented by Ernest T. Graff, Joseph T. Ryerson & Son, Inc., and was sponsored by the American Steel Warehouse Association with a membership of 167 which, Mr. Graff estimated, represents at least 75 per cent of the entire trade. He said that a number of members of the trade who do not belong to the

association have approved of the code. He said he believed that only 16 members of the trade have more than one warehouse; one member has 10 warehouses; two have eight; one has five; two have four; two have three, and eight have two branches. One large member, it was stated, really is a department of one of the large steel producers and another is a subsidiary of one of the important steel companies. Most of the members of the trade, however, it was added, are independent of the steel producers.

Mr. Graff explained that the code provides for a maximum 40-hr. week, averaged over a six-month period, which he considered absolutely essential to efficient conduct of the business. In this connection it was pointed out that most of the orders must be filled immediately due to the necessity of customers. The hours of work were declared to be inevitably very irregular and many of the products difficult and dangerous to handle so that experienced men are required.

Unfair Competition Prevented

Speaking on the commercial provisions of the code, Mr. Graff said it was considered necessary to have them so drawn as to prevent unfair methods of competition. Two points were emphasized. They concerned the open price and the filing systems.

Regarding the open price policy it was stated by Mr. Graff that the price which the steel warehouseman pays for all his products is the published price of the steel mills. Freight charges are published. The filed prices of the warehousemen will be open to the public, it was pointed out, and the part of the price paid by any consumer which covers the warehouseman's cost of doing business and profit readily can be calculated by simple arithmetic by any consumer. In addition, it was explained, the consumer can purchase direct from the mills, if he so elects.

"Under these circumstances," said Mr. Graff, "it is impossible to maintain a spread between the mills' prices and those of the warehousemen at an unfair level, even if the warehousemen desired to do so.

"The mills sell to all buyers, including warehousemen at prices determined on the basing point system. This code does not set up any basing points for the steel warehousing trade; it only uses the mill basing point system set up by the iron and steel code.

So long as the mill basing point exists the warehousemen are bound to buy their products on that basis. Nor can they ignore the competition of the mills in making direct sales to consumers. They must, therefore, in dealing with those products where freight is an important consideration base their products on the mill basing points.

"The mill under the basing point system is alleged sometimes to include in determining the price an amount equal to transportation charges over a longer distance than that over which the material is actually shipped. The warehouseman, on the contrary, includes in determining his price an amount which is frequently less and never greater than the transportation charge for the distance over which the material is shipped. The warehouseman, in effect, is forced to absorb in many cases the amount by which the transportation charges from the mill basing point to the warehouse and from the warehouse to the point of delivery exceeds the transportation charges from the mill basing point to the point of delivery.

"The treatment of transportation charges by the mills and by the steel warehousemen is fundamentally different."

Clarifying Amendments Offered

A number of amendments, most of them of a clarifying character, were offered. One would prohibit quick changes in prices as a means of preventing the taking of large orders at a low price and then returning to higher levels. This amendment would require that prices could not be changed until they had been in effect for at least five days.

Definitions were explained by G. M. Congdon, Congdon & Carpenter, Providence, R. I., and reasons were given for excepting merchant and oil country pipe, reinforcing bars, and galvanized sheets from the code. Pipe, it was stated, is generally sold direct by mills or through their agents, while the other products are under separate codes.

The labor provisions were explained by Robert C. Ross, Joseph T. Ryerson & Son, Inc.; and Guy P. Bible, Horace T. Potts Co., Philadelphia, told of the method proposed for electing 21 members on the general code authority and of conducting other elections for setting up divisional code authorities. He

pointed out that each warehouse would have a vote in selecting the code authority, so that, for instance, a company with 10 warehouses would have 10 votes. On other questions two ways of voting were proposed, one according to the foregoing plan and the other basing the votes on sales volume, one vote for each \$10,000. A proposal must be carried by a majority of both classes of votes. Warehouses with more than one vote, he said, based on number, total about 61, whereas there are 231 additional votes. This was brought out to make it clear that the larger interests could not control the code authorities, though the proposal was the subject of considerable questioning by Mr. Alexander and Legal Adviser J. Wayne Ley.

The proposal covering liquidated damages for code violations also was attacked by E. L. Culver of the Consumers' Advisory Board who expressed doubt that the courts would enforce such provisions. This was one of the subjects discussed after the hearing. Mr. Culver said the board was "dead against such a provision."

Price Filing System Explained

Lester Brion, Peter A. Frasse Co., New York, explained the price filing and basing point systems. Mr. Alexander called attention to the fact that the basing system is "under fire" by the Federal Trade Commission and inquired of Mr. Brion what the result would be if the warehouses departed from the basing point system. Mr. Brion pointed out that competition with mills made it necessary that the warehouse adopt the mill basing point system in figuring prices. He declared, in reply to a question by Mr. Alexander, that if an f.o.b. warehouse price were used the cost to consumers would be greater. Also he said the change would require different methods of figuring transportation costs. Regarding the proposed 10-day price filing system, Mr. Alexander called attention to the fact that the NRA has done away with this policy and that it will not be permitted to go into pending codes. The new policy requires that prices be made effective immediately upon filing, and reaction from various important industries indicates that this has greatly diminished their interests in codes. Mr. Alexander also questioned Mr. Brion extensively regarding the methods used for determining extras and deductions. When it was stated that the purpose is to establish uniformity in each district Mr. Alexander raised the point as to competition. When asked if competition now exists he was told that it does, and H. B. Ressler, New York, representing Joseph T. Ryerson & Son, Inc., estimated that there is a variation as high as \$10 a ton in warehouse prices on ordinary products, such as plates, shapes and steel bars.

Roscoe Ewing, Cleveland, representing the National Association of Distributors of Secondary Steel Products,

asked that these products be exempted from the code. He said the association is willing to come under the code for the wholesaling and distributing trade. Mr. Colley, Morris-Wheeler Co., Philadelphia, proposed an amendment which would prohibit a member from allowing a greater discount than that allowed by the majority of dealers in his district. He also proposed that the present discount for prompt payment be continued instead of the proposed discount of one-half of one per cent. George E. Dix, Steel Union Co., New York, spoke for importers and asked that they be exempted from the code. He made the point that they are included in the code for the importing trade on which a hearing was held. The proposal of Mr. Dix was the subject of a post-hearing conference, but domestic warehouse interests at the hearing plainly indicated they opposed exempting steel importers from the warehouse code.

Sheet Metal Code Heard

The day after the hearing on the steel warehouse code, distributors of sheet metal presented a code. It was proposed that the code become a supplement to the code for the wholesaling and distributing trade and be known as the code for the sheet metal distributing trade.

J. M. McNeive, W. F. Potts Co., Philadelphia, as a representative of the National Association of Sheet Metal Distributors, Inc., in presenting the code, said that there are in the trade 238 firms and that the association members represent approximately 68 per cent of the total volume of the trade.

Thomas H. Bohen, vice-president, Copper and Brass Warehouse Distributors' Association, New York, asked that the definition of the industry be amended in such manner as to exclude copper products. Similar modification of the definition was asked by Mr. Graff, speaking for the American Steel Warehouse Association and by Mr. Ewing, representing the National Association of Distributors of Secondary Steel Products.

Only limited discussion was given to provisions for administration and trade practices. Doctor Alexander announcing that these would be considered in detail at a post-hearing conference. Henri Sokolove, representing the Research and Planning Division and Mr. Culver said they would object to several of the trade practice provisions. Among provisions objected to were one which outlaws orders for "pooled" shipments in carload lots or less, an open price provision and the provision that the divisional code authority may, subject to approval by the administrator, authorize certain deductions and extras in determining net prices.

Only one of the sections to which objection was made resulted in any general discussion and the proponents

of the code quickly agreed to its elimination. This was a provision that price schedules of products determined by the divisional code authority to be mill products shall show the warehouse basing point price and the warehouse base price plus or minus the minimum extras and maximum deductions.

Manganese Castings Makers Submit New Labor Section

Producers of manganese steel castings submitted an entirely new labor section calling for a maximum work week of 40 hr. in any one week and minimum wages of 40c. an hr. for male labor and 35c. for female labor making light cores. Assistant Deputy Administrator Fentress H. Kuhn questioned the code committee as to the reason it does not want to operate under the steel casting code. He was told that it was believed that a separate code will be considerably less expensive to administer. A. W. Daniels, American Manganese Steel Co., Chicago, is chairman of the code committee of the Manganese Steel Founders Society, sponsor of the code. The code was presented by George Link, Jr., counsel for the society. Other members of the code committee who addressed the meeting were George R. Hanks, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.; George R. Lyman, Pettibone-Mulliken Co., Chicago; H. M. Bird, Columbia Steel Casting Co., Portland, Ore.; E. C. Bauer, Washington Steel Co., Chicago; W. L. Jackson, Frog Switch Mfg. Co., Carlisle, Ind., and L. W. Jones, Manganese Steel Forging Co.

Prices Systems Raise Differences

Differences over pricing systems developed at a hearing on the code for the electric hoist and monorail manufacturing industry. The code proposes a so-called open price system for the hoist division while the monorail branch has a method of filing prices with the proviso that the price lists shall not be disclosed to competitors. Roy Loudon, Fairfield, Ia., representing the Loudon Machine Co., and chairman of the code committee for the monorail branch of the industry, charged that the present set-up creates an industry "with but one price." He added that it is "the first step in creating a monopoly" and urged adoption of a provision which would allow sales below cost to meet competition. Mr. Loudon represented a group who sell direct to consumers.

Sponsored jointly by the Electric Hoist Association and the Monorail Manufacturers' Association, Assistant Deputy Administrator F. H. Kuhn asked why the open price system was not applicable to the monorail branch. He was told by E. Donald Tolles, New York, counsel for both associations, that there is a difference of opinion among monorail members who sell direct and those who deal with agents.

It was pointed out that the provision was drafted as a compromise and represents the nearest approach to the open price plan inasmuch as it calls for the filing of prices to which members would agree to adhere. It was explained that Article X, to which Mr. Loudon objected, was written into the code so that distributors and resellers may without expense enjoy the benefits of the open price plan by listing their own selling prices or may enter into agreement with suppliers to sell at the manufacturers' filed prices. Legal Adviser C. R. Wetzel said that manufacturers could not expect to control distributors unless it was shown that a majority of them sell direct. A conference was held at the hearing in an effort to clear up controversial points.

Importing Trade Code Hearing

At the hearing on a code of fair competition for the importing trade C. E. Bingham, New York, chairman of the code committee representing the trade and sponsoring the code, said the committee has been working on the proposed code for six months; has held many conferences within the trade and has attempted to inform all persons engaged in importing of the provisions of the document. He said no objections had been registered to the general principles of the code.

It was explained that the proposed importing trade code closely follows, and in many details is identical with, the wholesaling code, the intention being to avoid jurisdictional conflicts, and not leave importers in doubt as to which code they shall come under.

Wire, Rod and Tube Die Code Modification Hearing

The wire, rod and tube die industry's request for its skilled die workers to work 48 hrs. per week instead of the code requirement of 40 hrs. was heard. Under the terms of the proposed amendment such workers would be paid time-and-a-half for such overtime, and the dispensation would last only until there should be a sufficient supply of trained workers. Little opposition to the proposal developed at the hearing, although it was apparent that there are two factions of the industry, the exclusive die makers and those whose die production is incidental. The latter group do not favor the separate die code, but prefer to operate under the special tool, die and machine shop code.

File and Spring Makers Get Hearings

Supplemental codes for three subdivisions of the fabricated metal products manufacturing and metal finishing and metal coating industry, namely file and spring manufacturing, were presented by William J. Connor, counsel for the Fabricated Metal Products Federation. O. L. Hunt, representing the NRA Consumers' Advisory Board, questioned the advisability of permit-

ting the code authority for the file industry to establish and enforce a proposed schedule of fines and penalties; and the assistant deputy noted objections filed by various firms to the proposed limit of three months on contracts, the proposed 10 per cent additional charge on broken package orders and other proposed trade practices.

The assistant deputy also noted an objection, filed by the code committee of the automotive parts and equipment manufacturing industry, to the proposed definition of the spring manufacturing industry; and J. A. O'Donnell, representing the NRA Labor Advisory Board, urged that the spring industry's code be amended to prohibit home work. This latter request was agreed to by L. C. Humason, representing the code committee of the industry.

Brass Forging Code

Presentation of the code for the brass forging manufacturing industry was made by George P. Lamb, also of counsel for the Fabricated Metal Products Federation. Questioning by the assistant deputy developed the fact that the nine members of the sponsoring association produced some 90 per cent of the industry's volume, and that no effort had been made by the association to solicit memberships from others of the 216 listed firms in the industry. After considerable discussion, the assistant deputy ruled that any decision by the Administration regarding the code would be held in abeyance until such time as the trade association submitted proof it had appraised the entire industry of its efforts to prepare an acceptable code.

Code Approved

General Johnson has approved the code for the wrench manufacturing industry and supplemental fair trade practice provisions for the shovel, dragline and crane industry. The code for the wrench industry is a supplement to the code for the fabricated metal products manufacturing industry and is devoted entirely to the establishment of a supplementary code authority and provisions for open price lists. The code for the shovel, dragline and crane industry as approved Nov. 8, 1933, was applicable to power-operated convertible shovels and draglines and special modifications. The supplemental trade practices are made applicable to the large machine and locomotive crane divisions of the industry. Also approved was an exhibit designed to establish performance standards for locomotive cranes.

Code Hearings Announced

A proposed code of fair competition for the metal jacketed jug manufacturing industry, a division of the fabricated metal products manufacturing and metal finishing and metal coating

industry, will have a public hearing at 10 a. m. on April 17, in the Hall of Nations, Washington Hotel, before Deputy Administrator L. S. Horner.

The complete wire and iron fence industry, also a division of the fabricated metal product manufacturing and metal finishing and metal coating industry, will present its proposed code at the same hearing. Both branches of the industry propose the same wages, hours and labor provisions contained in the master code for the fabricated metal industry which was approved by the administration last November.

Deputy Administrator George S. Brady will preside at a hearing April 16 on a petition for the modification of the minimum wage scale of the code for the pump manufacturing industry so as to establish a rate of 27c. an hour in the South which now, along with all other areas, carries a rate of 35c. The petition was presented by the Hardie-Tyne Mfg. Co., Birmingham, and Layne & Bowler, Inc., Memphis, Tenn., has signified its intention of joining the petition, according to the NRA.

A hearing will be held April 18, on the proposed code for the nickel and nickel alloys industry. The code is sponsored by the Nickel Alloys Association, claiming to represent 90 per cent of the industry.

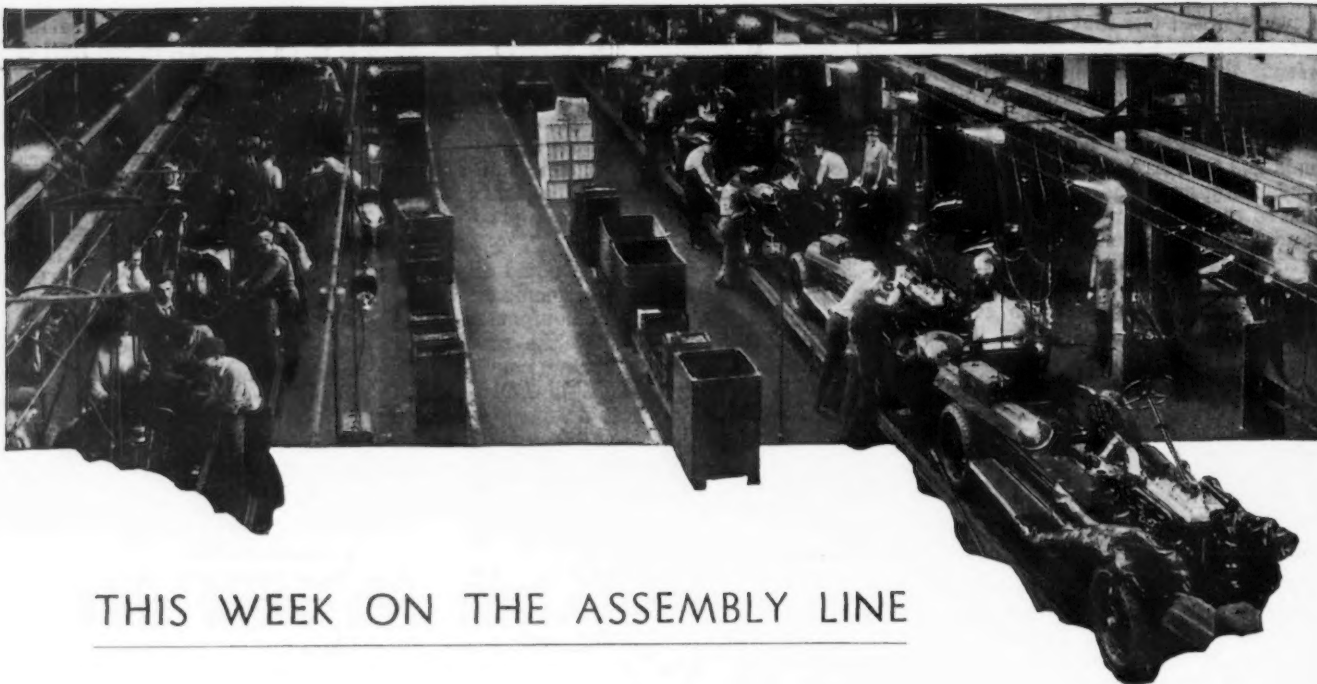
WASHINGTON, April 10.—General Johnson has approved code for the steel plate fabricating, shoe machinery and railroad special track equipment industries. The latter code became effective upon approval. The other two codes become effective April 16.

NRA Approves Boiler Cost Accounting

WASHINGTON, April 10.—Effective April 21, General Hugh S. Johnson has approved principles of cost accounting for the boiler manufacturing industry. The standard principles approved are those contained in the manual of standard accounting and cost system by the Machinery Builders' Society, a pamphlet of 75 printed pages. Only the principles of the system need to be followed, according to the administrator's order.

General Electric Orders Up 50 Per Cent

ORDERS received by the General Electric Company during the first quarter of 1934 amounted to \$38,148,654 compared with \$25,511,644 for the corresponding period of 1933, an increase of 50 per cent, according to an announcement by Gerard Swope.



THIS WEEK ON THE ASSEMBLY LINE

General Motors, Ford and Chrysler Schedule 365,000 Units in April

DETROIT, April 10.

DESPITE a troubled labor situation which promises anything but peace in the weeks ahead and the possibility that price increases announced the past week may tend to restrict retail sales, motor car manufacturers are proceeding with a production program which indicates no pessimism about the outlook.

Ford originally set up a tentative schedule of 85,000 units for April, but recently has raised the goal to 90,000. Now comes the word from Dearborn that assemblies will be pushed as high as it is possible to get them this month, the only limitation being the success in securing bodies and parts. It has been a long time since the Ford monthly output hit 100,000 units, but there is a good chance that this may happen this month.

Chrysler is going along at a pace never before attained. It has given its divisions the task of increasing assemblies to 100,000 units in April, but whether this can be done is dependent directly on a steady and large flow of parts to assembly lines. Chrysler is turning to every available source of supply to help it expand its facilities to produce a greater number of cars. Parts, particularly forgings and stampings never before ordered outside, are being placed daily, with rush deliveries stipulated.

April To Go Over 400,000 Mark

The April program for General Motors divisions calls for the following number of units: Chevrolet, 127,-

000; Pontiac, 18,600; Buick, 8746; Cadillac-La Salle, 3000; and Oldsmobile, 8000. Thus General Motors, with a total schedule this month of 165,346 units, Chrysler and Ford will try to make close to 365,000 units during April. Unless a hitch occurs in the industry's plans, the current month will witness a production in excess of 400,000 units.

Although retail demand has been relatively good, especially in certain agricultural regions, the bad weather during March in almost all parts of the country retarded sales. Manufacturers believe that this delayed buying will be felt this month and next. They are very sanguine regarding business in May and June. Unless production should be interrupted by strikes, the feeling in Detroit is that no month in the second quarter will dip under 325,000 units, and possibly all months will be above the 350,000 mark.

Employment at Four-Year Peak

If it were not for the turmoil in which organized labor keeps the Detroit district, all of the indices pertaining to the automobile industry would be cause for jubilation. Industrial employment in Detroit rose to a four-year peak on March 31 when the index number of the local Board of Commerce was 107.7, a gain of 157 per cent over a year ago. The all-time high figure was 137.8 in March of 1929.

Unofficial estimates place the number of persons on industrial payrolls in this city at 325,000, of whom 225,-

000 to 250,000 are directly engaged in the automobile and allied trades. Local travel has become so heavy that the Detroit Street Railways has put into operation every available street car and bus, has rented buses temporarily from the Detroit & Windsor Tunnel Co. and has placed rush orders for a number of new buses.

Yet the signs of returning prosperity which Detroiters see every day fail to arouse the normal amount of enthusiasm because of the continuous, untiring agitation on the part of labor. The industry gradually seems to be getting acclimated to all-year round labor storms, whereas previous to the enactment of the National Recovery Act with its Section 7-a, the industrial relations sky was clear and bright. Developments in the last week which threaten to cause further strife are treated in a separate article in this issue.

Motor Car Prices Increased

The steel industry may ponder a long time over the matter of raising prices \$4 or \$5 a ton, and even after an affirmative decision is reached continue to support an archaic system which prevents mills for two or three months from realizing the benefits of higher prices. Not so in the automobile industry. It has slapped on a healthy increase in retail prices (with the exception of Ford) without any forewarning and to become effective immediately.

One explanation proffered by observers is that the industry wished to pass along higher prices to the public while recent wage advances were still fresh in mind, thus impressing upon the car buyer that he is the person who must pay for high labor costs. In some newspaper accounts announce-

ing higher automobile prices, emphasis was put on increased steel prices as a contributing factor. This is rather far-fetched in view of the fact that most car makers will take in enough steel on second quarter contracts to carry them through most or possibly all of their 1934 production runs. The recently-named steel prices may not affect some users until 1935 models get under way.

No Low-Price Car Today

Revelation of new retail prices is further proof that there is no low-price car today in the sense that people used to think of Ford's model T. The standard Chevrolet, to be announced next Saturday, bears the lowest price of all popular cars, \$490 for the sport roadster. It should be borne in mind that this is the f.o.b. factory price, and the customer actually pays substantially more than the list price, even if he lives in Detroit and the car is made here.

This serves to emphasize the deceptive basis on which the entire industry builds its pricing arrangement. The base price which is advertised almost invariably is on a roadster or some other model bought by one or two out of a hundred customers. The closed models, constituting 95 per cent of total sales, are considerably higher. Even here, only a beginning has been effected. By the time the motorist pays for accessories, freight and a dozen other items, he is out a sizable sum beyond the list price. For example, the buyer of a four-door Chevrolet master sedan pays a delivered price at Detroit of \$90.50 more than the list price. If the car is a Ford, the spread is \$89.12; if a Plymouth, \$98.84. Equipment builders probably would like to figure out a way to get from the automobile manufacturer legitimate extras which he wangles from the car buyer.

Less Speculative Buying Anticipated

Increased steel prices already are having the effect of expanding specifications somewhat. While motor car companies are certain to do some stocking ahead at current prices, they are not expected to indulge in speculative buying to the extent that they did last June and September. The steel trade has long suspected that users who insisted on laying in four or five months' requirements of certain items at low prices have found that extra handling costs, plus deterioration, plus a general disturbance of orderly processes, practically offset the savings in price. Some users privately have confirmed that fact and say that they will never make that mistake again.

Not all steel mills are in accord with the plan for moving up prices \$8 a ton on light-gage sheets. They point out that if the base price is marked up too steeply and extras are added

New F.O.B. Factory Prices on 2-Door Sedan or Coach

Chevrolet standard six.....	\$520
Ford standard V-8.....	535
Plymouth standard six.....	570
Ford de luxe V-8.....	575
Terraplane standard six.....	595
Chevrolet de luxe six.....	615
Plymouth de luxe six.....	640
Terraplane de luxe six.....	690
Oldsmobile six.....	705
(5-passenger coupe)	
Dodge six.....	740
Pontiac eight.....	745
Graham standard six.....	745
(Coupe model)	
Studebaker Dictator.....	770
(4-passenger coupe)	
Hudson de luxe eight.....	855
(116-inch wheelbase)	

for wide sheets, automobile makers will be tempted to use narrow sheets and weld them to save money.

Wide Sheets Popular

The subject of what to do about wide sheet capacity is perplexing sheet mills. One of the larger automobile companies wants to use sheets 90-in. wide for its 1935 car and has in mind ultimately stamping an entire side of a car out of a single sheet perhaps 14 ft. long. It has been trying to enlist the interest of some sheet maker in building a wide mill to take care of these requirements. However, many difficulties confront the sheet industry. The trend toward wider sheets, involving expenditures running into the millions, wouldn't add a ton to consumption. It merely means taking tonnage from one niche and putting it in another one, thus rendering considerable present equipment obsolete.

At this time, with banks refusing to make long-time loans, the financing of a wide sheet mill would be a difficult task. The matter of rolling very wide, long sheets, with uniform tolerance in thickness and with uniform quality throughout, is yet to be tackled. In consideration of awkwardness in handling, except by means of a special system the cost of which would be justified only by mass production on a large scale, wide sheets probably would have only a limited market. There seems little doubt in the trade that the mill which plunges boldly into this experiment stands a good chance to corner a comfortable share of the automotive sheet business.

Whether any mill will go ahead with a program in time for car makers to figure on very wide sheets in 1935 cars appears doubtful. The widest sheets which can be rolled today are 75 in. It will be recalled that two years ago Pontiac, in making the two front fenders for its car, stitch-welded two flat blanks together and then put the material through a drawing operation. The trouble was that if the welds failed in the draw, two

fenders were spoiled. It is said that the high scrap losses resulting from this method brought about its abandonment.

Labor Trouble Cuts Equipment Orders

Continued threat of labor trouble has had a paralyzing effect on machine tool sales to the automobile industry. Managements are unable to figure costs so long as wage rates are being constantly changed. The trend of users under the circumstances is naturally toward a watchful waiting policy in the hope that some stability soon will appear in a situation which union organizers apparently are trying to keep as unsettled as possible.

Although it is not generally known, at least one automobile plant has gone so far as to let its employees vote on whether they wish a straight hourly rate or a bonus system. Those who wanted the day rate are now being paid on that basis and are working on the same production line with those who chose the bonus system. These day workers are mostly A. F. of L. members.

Evidence accumulates to the effect that many 1935 models will be out early. The first series, sponsored by a well-known company, may be on the market by August 1. Another is said to be scheduled for September. If these programs eventuate as now planned, they will provide the machine tool trade with considerable business.

Detroit Notes

The standard Chevrolet will be advertised as "the world's lowest priced six." It will sell at \$85 to \$95 under the master series. . . The new small Buick now is definitely scheduled for public presentation on May 12. All the talk about its having a radically designed body is discounted. It is said that it will closely resemble the present 1934 line. . . Dodge Brothers are employing nearly 30,000 workers on Dodge cars alone. Dodge set a record for the year on March 31 when factory shipments for that day amounted to 2170 passenger cars and trucks. . . Chevrolet production in the first quarter totaled 223,010 units, compared with 148,336 in the same period of 1933. . . Chevrolet's output in March was the largest in 34 months.

In the first quarter Ford sold 46 per cent of all cars purchased at retail in metropolitan Detroit. . . Ford states that if prices of parts and materials go too high, he will start to make more parts himself. . . Campbell, Wyant & Cannon Foundry Co. is planning to reopen its Muskegon Heights foundry within 10 days to supplement production at its Muskegon plant. . . Hudson shipped over 5000 cars during the week ended March 31. Its April schedule calls for 21,000 units.

Labor Trouble Looms Once More in Detroit

EVENTS of the past week indicate that recent appointment by President Roosevelt of the Automobile Labor Board will prove no panacea for the labor ills which now beset the motor car industry.

The Automobile Labor Board was not established as an agency to settle strikes, but to determine the representation of various labor groups in individual plants in the matter of collective bargaining, to pass upon cases of alleged discrimination against union workers, and to administer generally the labor provisions of the National Recovery Act as agreed upon at the White House by the automobile industry and by organized labor.

However, almost immediately upon its appointment the board was asked to try to settle a strike of several weeks' standing at the plants of the Nash company and spent part of last week in Wisconsin in conferences with workers and the management. An agreement finally was worked out, but the strikers at the Kenosha plant decisively rejected it, although the Racine and Milwaukee plants' employees voted for it. Workers at the various plants agreed that none would return to jobs until a settlement was accepted by the men at all three plants. The board's efforts thus far have not been successful, despite the fact that the tentative agreement was hailed at first as a triumph for the new agency.

The board was also drawn into the strike at Motor Products Corp., which ran almost a week. Issues in this strike were confused by a multitude of charges and countercharges. The United Automobile Workers' Union and Metal Polishers' International Union, both A. F. of L. affiliates, were involved. So was the Mechanics Educational Society. Trouble apparently started in the plating department, where A. L. Lott, vice-president of the company, declares the average pay was 83c. an hour. This is asserted to be 15 to 40 per cent more than is paid by other companies.

The A. F. of L. has increasing opposition from rival labor groups within the industry. Officers of company unions, for instance, are reported not at all pleased that the President appointed Mr. Byrd who is definitely identified with an organization possessing a minority of employees in the industry. The consensus of opinion among non-partisan observers is that the board has not yet had time to get organized and to function properly. It can't be expected to do wonders in a few days' time. As Doctor Wolman stated, "What is going to develop we don't know, but we don't see why matters

troubling the automobile industry cannot be adjusted if we use some patience."

Additional Difficulties

On top of these difficulties the Mechanics Educational Society last week presented a list of demands to both automobile companies and independent shops on behalf of its membership of tool and die makers. These demands included an increase in rates in line with the increases granted to production workers by the automobile industry recently, a maximum work week of 35 hours with no work on Saturdays or Sundays and 24-hr. notice of the lay-off or discharge of employees.

Matthew Smith, general secretary of the Mechanics Educational Society, originally gave independent shops until Monday to make an offer, but later extended the time until Thursday of this week. Indications are that a strike will occur. Independent shops state that if things continue to drift in the direction in which they now are heading, they might as well turn their business over to the union, and they do not intend to do this without a battle. If a compromise should be effected, it actually would be a useless thing in the end, for it would only be a matter of time until new demands were presented by the union. So the mood of independent manufacturers at present is to stand their ground and have a show-down fight, which might as well come now as three months or six months hence.

The strike at Motor Products Corp. came to a sudden and dramatic end late Monday when the Automobile Labor Board, assisted by Edward F. McGrady, direct representative of General Johnson, was successful in getting the management to agree to compromise terms. Richard Byrd, labor member of the Board, Mr. Collins and Mr. McGrady then appeared before the strikers and persuaded them to accept the settlement. In addition to a 10 per cent increase in rates the agreement calls for protection of workers on the job through recognition of seniority rights, raises minimum rates for both men and women employees, and gives to the departmental union representative the right to check over the price rate adjustment in all cases of dispute. The end of the strike came a few hours after the Hudson Motor Car Co. had been compelled to shut down because it could not secure necessary parts from Motor Products, thus temporarily throwing 18,000 out of work. It is said that if the strike had been prolonged 24 hr. it would have forced Chrysler divisions to close. Following a meeting of officers of the Federal Automobile Union in Detroit Sun-

day a telegram was sent President Roosevelt criticizing Doctor Wolman and the Labor Board for being slow in setting up machinery for selection of shop committees under the representation plan of the President's agreement. Said Mr. Collins: "The Board has been settling difficulties by mediation instead of by decision as the agreement demands. It has not been handling discrimination cases properly. It has not lived up to the spirit of the President's agreement. Our principal criticism is of Doctor Wolman. His attitude is that there should be mediation. We have had too much mediation and it is time for action."

One of the chief reasons why the A. F. of L. is not in harmony with a policy of mediation is that it is a slow process and the A. F. of L. must get fast action in order to hold its members. Matthew Smith, general secretary of the Mechanics Educational Society, has declared that his organization will not carry any troubles before the Automobile Labor Board because of the A. F. of L. representative on it. The M. E. S. now has eight paid organizers in the field building up its production workers' division while the A. F. of L. has strengthened its forces here for a membership race with the M. E. S. The general feeling in Detroit industrial circles is that the M. E. S. has made its strike threat against independent tool and die shops largely as a move on Mr. Smith's part to bring his organization back into the spotlight which recently has been occupied exclusively by the A. F. of L. The M. E. S. as well as the A. F. of L. is faced with the necessity of showing its members that it is zealously aggressive in championing their cause. However, it is believed that the tool and die makers have few, if any, real grievances.

Of the 41 cases of alleged discrimination presented already to the Automobile Labor Board by the A. F. of L., General Motors has agreed to take back 18 men without waiting for a decision by the Board. This procedure is not altogether to the liking of the A. F. of L., which thinks that the Board has allowed General Motors to take the public stage with what looks like a generous attitude of reemploying 18 men and waiving any examination of their cases. The A. F. of L. intimates that all 18 cases were hand-picked by General Motors and the most flagrant cases of discrimination were not included in that group. There is a definite crystallizing of opinion in the industry that the A. F. of L. is deliberately attempting to wreck the Automobile Labor Board by continually criticizing it and insinuating that it is not doing what it was set up to do. It is claimed that the A. F. of L. realizes that its future in the Detroit district may not be rosy if the Automobile Labor Board functions as it should.

Heavy Contracting Follows Advances In Pig Iron and Finished Steel

Production Is Stimulated, Rising to 49½ Per Cent of Capacity,
And Further Gains Are Assured, Barring Labor Difficulties

THE general advance in iron and steel prices had the effect of driving in an unusually large volume of business. In some products bookings for the second quarter are two to three times those of the first quarter and contract commitments as a whole are fully 50 per cent larger than in the initial period. Certain classes of mills already have made commitments for all the steel that they can roll provided that consumers take out the maximum tonnages covered by their contracts.

The raw steel requirements of mills are increasing, with ingot output up to 49½ per cent from 48½ per cent a week ago, and still further gains in production are looked for during the remainder of April and in May, barring another outbreak of labor difficulties in the automobile industry. The settlement of the dispute at the Motor Products Corp., Detroit, is heartening, but there continues to be danger of a strike being called by the Mechanics Educational Society, rival of the American Federation of Labor in the motor car industry and sponsor of the tie-up of tool and die shops that occurred late last year.

IF action by this group is averted, April output of motor cars will probably exceed 400,000 units. General Motors alone has a schedule of 165,346 cars, while Ford and Chrysler will turn out 90,000 to 100,000 each. But even if motor car production is interrupted, the steel industry will suffer less than would have been the case a month ago, because of the larger proportion of tonnage that is now coming from the railroads and other classes of consumers.

Railroad releases against contracts are steadily growing heavier, and further buying by the carriers is in sight. While rail contracting will probably be concluded shortly with the placing of orders by the Baltimore & Ohio and the Norfolk & Western, a sizable car and locomotive program, including both the purchase of new equipment and extensive repairs to existing rolling stock, remains to be carried out. The Great Northern has obtained a Government loan to finance the repair of 6374 freight cars, 138 passenger cars and 316 locomotives. The Milwaukee has a loan for the purchase of 75 passenger service cars. The Chicago Great Western is inquiring for 500 freight cars and the Gulf, Mobile & Northern for 200. The Delaware, Lackawanna & Western has purchased 500 steel hopper cars and 20 locomotives.

FABRICATED structural steel awards, at 12,160 tons, compare with 8150 tons last week. New projects total 13,700 tons as against 18,300 tons in the

previous week. The price advances resulted in a rush on the part of fabricators to obtain an extension of their "protections" on pending projects. Under the code, an advance in price limits protection to a further period of 60 days, during which time the fabricator must sign a formal contract for the steel.

Recent price advances will in no case become effective until the end of this week and some of them will not go into effect until April 20. All producers did not file price changes simultaneously and consequently the effective dates have been advanced to 10 days after the last filing. Prices on the commoner grades of coke pig iron have gone up \$1 a ton except at Neville Island, Pittsburgh, where a 50c. advance brings base prices to a parity with those at Sharpsville, Pa. Other price changes, in addition to those announced a week ago, include advances of \$1 a ton on alloy steel bars, \$6 a ton on No. 20 vitreous enamel sheets, \$3 a ton on No. 10 vitreous enamel sheets, \$5 a ton on No. 10 cold-finished mill run sheets, \$8 a ton on long ternes, \$7 a ton on stock tin plate, \$8 a ton on No. 20 fender stock, \$5 a ton on No. 16 and heavier fender stock, \$3 a ton on floor plates, \$3 a ton on steel sheet piling, \$5 a ton on large rivets and a reduction of five points in the discount on small rivets. Higher prices on tie plates and track spikes are expected, but whether similar action will be taken on standard-section rails is still uncertain. Light rails, rolled from billet steel, have been marked up \$3 to \$35 a gross ton, Pittsburgh.

PENDING the effective dates of new prices, THE IRON AGE composites for pig iron and finished steel are unchanged at \$16.90 a gross ton and 2.028c. a lb. respectively. The scrap composite also is unaltered at \$12.58 a gross ton. Fully 125,000 tons of scrap has been purchased at Chicago in the past week and the total turnover for the entire country is estimated at 500,000 tons.

Steel production has risen two points at Pittsburgh to 37 per cent of capacity, three points at Chicago to 50 per cent, four points in the Philadelphia district to 40 per cent, two points to 56 per cent in the Valleys, two points to 58 per cent at Cleveland, and four points to 54 per cent in the South. Operations in the Wheeling district are off two points to 68 per cent.

Actual production figures for March showed an operating rate of 47.81 per cent, or more than a point above the average of 46½ per cent of the American Iron and Steel Institute's weekly forecasts. The average of THE IRON AGE's weekly operating estimates for March was 48.33 per cent, or only about one-half a point higher than the official monthly figure.

▲▲▲ A Comparison of Prices ▲▲▲

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

	Apr. 10 1934	Apr. 3 1934	Mar. 13 1934	Apr. 11 1933
<i>Per Gross Ton:</i>				
No. 2 fdy., Philadelphia....	\$19.26	\$19.26	\$19.26	\$14.34
No. 2, Valley furnace.....	17.50	17.50	17.50	14.50
No. 2 Southern, Cin'tl.....	18.13	18.13	18.13	13.82
No. 2, Birmingham†.....	13.50	13.50	13.50	11.00
No. 2 foundry, Chicago*.....	17.50	17.50	17.50	15.50
Basic, del'd eastern Pa.	18.76	18.76	18.76	14.09
Basic, Valley Furnace.....	17.00	17.00	17.00	13.50
Valley Bessemer, del'd P'gh..	19.76	19.76	19.76	16.89
Malleable, Chicago*.....	17.50	17.50	17.50	15.50
Malleable, Valley.....	17.50	17.50	17.50	14.50
L. S. charcoal, Chicago.....	23.54	23.54	23.54	23.17
Ferromanganese, seab'd car- lots.....	85.00	85.00	85.00	68.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Finished Steel

	Apr. 10, 1934	Apr. 3, 1934	Mar. 13, 1934	Apr. 11, 1933
<i>Per Lb.:</i>	Cents	Cents	Cents	Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh.....	2.25	2.25	2.25	2.00
Hot-rolled annealed sheets, No. 24, Chicago dist. mill..	2.35	2.35	2.35	2.10
Sheets, galv., No. 24, P'gh...	2.85	2.85	2.85	2.60
Sheets, galv., No. 24, Chicago dist. mill.....	2.95	2.95	2.95	2.70
Hot-rolled sheets, No. 10, P'gh	1.75	1.75	1.75	1.40
Hot-rolled sheets, No. 10, Chi- cago dist. mill.....	1.85	1.85	1.85	1.50
Wire nails, Pittsburgh.....	2.35	2.35	2.35	1.85
Wire nails, Chicago dist. mill	2.40	2.40	2.40	1.90
Plain wire, Pittsburgh.....	2.20	2.20	2.20	2.10
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.15
Barbed wire, galv., P'gh....	2.85	2.85	2.85	2.35
Barbed wire, galv., Chicago dist. mill.....	2.90	2.90	2.90	2.40
Tin plate, 100 lb. box, P'gh..	\$5.25	\$5.25	\$5.25	\$4.25

Rails, Billets, etc.

<i>Per Gross Ton:</i>				
Rails, heavy, at mill.....	\$36.37 1/2	\$36.37 1/2	\$36.37 1/2	\$40.00
Light rails, Pittsburgh.....	32.00	32.00	32.00	30.00
Rerolling billets, Pittsburgh.	26.00	26.00	26.00	26.00
Sheet bars, Pittsburgh.....	26.00	26.00	26.00	26.00
Slabs, Pittsburgh.....	26.00	26.00	26.00	26.00
Forging billets, Pittsburgh ..	31.00	31.00	31.00	31.00
Wire rods, Pittsburgh.....	36.00	36.00	36.00	35.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb...	1.60	1.60	1.60	1.60

Scrap

<i>Per Gross Ton:</i>				
Heavy melting steel, P'gh...\$14.25	\$14.25	\$14.50	\$10.00	
Heavy melting steel, Phila..	11.75	12.00	6.75	
Heavy melting steel, Ch'go..	11.75	12.50	5.25	
Carwheels, Chicago.....	11.75	12.25	8.00	
Carwheels, Philadelphia.....	13.00	13.00	8.50	
No. 1 cast, Pittsburgh.....	13.75	13.75	9.00	
No. 1 cast, Philadelphia.....	13.25	13.25	8.00	
No. 1 cast, Ch'go (net ton)...	9.50	9.50	6.75	
No. 1 RR. wrot., Phila.....	11.00	11.00	7.50	
No. 1 RR. wrot., Ch'go (net)	9.50	9.50	4.50	

Finished Steel

<i>Per Lb.:</i>	Cents	Cents	Cents	Cents
Bars, Pittsburgh.....	1.75	1.75	1.75	1.60
Bars, Chicago.....	1.80	1.80	1.80	1.70
Bars, Cleveland.....	1.80	1.80	1.80	1.65
Bars, New York.....	2.08	2.08	2.08	1.95
Plates, Pittsburgh.....	1.70	1.70	1.70	1.60
Plates, Chicago.....	1.75	1.75	1.75	1.70
Plates, New York.....	1.98	1.98	1.98	1.598
Structural shapes, P'gh....	1.70	1.70	1.70	1.60
Structural shapes, Chicago..	1.75	1.75	1.75	1.70
Structural shapes, New York	1.95 1/4	1.95 1/4	1.95 1/4	1.86775
Cold-finished bars, P'gh....	2.10	2.10	2.10	1.70
Hot-rolled strips, Pittsburgh	1.75	1.75	1.75	1.45
Cold-rolled strips, P'gh....	2.40	2.40	2.40	1.80

Coke, Connellsville

<i>Per Net Ton at Oven:</i>				
Furnace coke, prompt.....	\$3.85	\$3.85	\$3.50	\$1.75
Foundry coke, prompt.....	4.60	4.60	4.25	2.50

Metals

<i>Per Lb. to Large Buyers:</i>	Cents	Cents	Cents	Cents
Electrolytic copper, refinery..	8.25	7.75	7.75	5.12 1/2
Lake copper, New York.....	8.50	8.00	8.00	5.50
Tin (Straits), New York....	55.80	55.50	54.35	25.50
Zinc, East St. Louis.....	4.40	4.30	4.37 1/2	3.10
Zinc, New York.....	4.75	4.65	4.72 1/2	3.47
Lead, St. Louis.....	4.15	3.90	3.90	3.12 1/2
Lead, New York.....	4.25	4.00	4.00	3.25
Antimony (Asiatic), N. Y...	7.95	7.60	7.50	5.95

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

▲▲▲ The Iron Age Composite Prices ▲▲▲

Finished Steel

April 10, 1934	2.028c. a Lb.
One week ago	2.028c.
One month ago	2.028c.
One year ago	1.879

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products make 85 per cent of the United States output.

	HIGH	Low
1934.....	2.028c., April 10:	2.028c., Jan. 2
1933.....	2.036c., Oct. 3:	1.867c., Apr. 18
1932.....	1.977c., Oct. 4:	1.926c., Feb. 2
1931.....	2.037c., Jan. 13:	1.945c., Dec. 29
1930.....	2.273c., Jan. 7:	2.018c., Dec. 9
1929.....	2.317c., April 2:	2.273c., Oct. 29
1928.....	2.286c., Dec. 11:	2.217c., July 17
1927.....	2.402c., Jan. 4:	2.212c., Nov. 1

Pig Iron

\$16.90 a Gross Ton
16.90
16.90
13.68

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	HIGH	Low
1934, April 10:	\$16.90, Jan. 27	\$16.90, Jan. 3
1933, Dec. 5:	13.56, Jan. 3	13.56, Dec. 6
1932, Jan. 6:	14.79, Dec. 15	15.90, Jan. 6
1931, Jan. 7:	15.90, Dec. 16	18.21, Jan. 7
1930, May 14:	18.21, Dec. 17	18.71, May 14
1929, Nov. 27:	17.04, July 24	18.59, Nov. 27
1927, Jan. 4:	17.54, Nov. 1	

Steel Scrap

\$12.58 a Gross Ton
12.58
13.00
7.33

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	HIGH	Low
1934, Mar. 13:	\$11.33, Jan. 2	12.25, Aug. 8:
1933, Jan. 5:	6.75, Jan. 3	8.50, Jan. 12:
1932, Jan. 6:	8.50, Dec. 29	11.33, Jan. 6:
1931, Feb. 18:	11.25, Dec. 9	15.00, Feb. 18:
1930, Jan. 29:	14.08, Dec. 3	17.58, Jan. 29:
1929, Dec. 31:	13.08, July 2	16.50, Dec. 31:
1927, Jan. 11:	13.08, Nov. 22	15.25, Jan. 11:

Production Rises in Pittsburgh and Valleys



Further Gains Looked for During Remainder of April and in May—Forward Covering Has Been General—Scrap Prices Unchanged

PITTSBURGH, April 10.—Second quarter contracting for steel, most of which is in anticipation of higher prices to become generally effective by April 16, has begun to abate. Most consumers have already committed themselves fairly heavily for the quarter at present prices, and steel producers will shortly begin to reap a modicum of benefit from operating economies usually attending accelerated rolling schedules. At least a few steel companies here have booked enough second quarter tonnage to plan substantially higher output during the remainder of April, May and part of June.

Steel ingot production in the Pittsburgh district has jumped two points this week to 37 per cent of capacity. A similar increase boosts the Valley output this week to 56 per cent. Production in the Wheeling district, however, is down two points to 68 per cent. An independent steel company blast furnace has been blown in in the Pittsburgh district. Finishing mills, though maintaining unchanged schedules this week, are poised to forge ahead within a week or two, when rolling against second quarter business will really get under way. Sheet mills are holding at 55 per cent, as are strip mills at 60 per cent. Satisfactory specifications are holding tin plate production at around 80 per cent, with fair prospects of continuation at this rate for the next three weeks. Structural steel fabricators in the Pittsburgh area are being favored with slightly more tonnage. Wire mill schedules are slowly gaining ground.

Pig iron quotations at Neville Island and at Sharpsville will be advanced 50c. and \$1 a ton on April 17. Scrap is quiet and notably unchanged.

Pig Iron

New quotations have been filed for establishment on April 17 at Neville Island, Pa., and Sharpsville, Pa. Advances of 50c. and \$1 a ton will place prices at both of those points on a parity. When the changes become effective, foundry and malleable will be quoted at \$18.50, Bessemer \$19, and basic \$18, Neville Island or Sharpsville. In anticipation of these

advances, consumers are covering forward requirements very freely. Aggregate tonnage, however, lacks the support of business from large consumers, who are generally still drawing from heavy inventories.

Semi-Finished Steel

The advance of \$3 a ton on rerolling billets, blooms and slabs will become effective at Pittsburgh and Gary, Ind., on April 14, and at Youngstown on April 16. Sheet bars at Pittsburgh will be marked up \$4 a ton on April 14. Skelp will next week be advanced \$2 a ton to 1.70c., Pittsburgh or Youngstown. Wire rods will be marked up \$2 a ton to \$38, a gross ton, Pittsburgh or Cleveland, on April 14. The impending increases have stimulated a fair volume of orders from non-integrated mills. A slight improvement is reported in the movement of wire rods, which have been recently extremely dull. Sheet bars are probably the most active product.

Bolts, Nuts and Rivets

Price advance on rivets are in no way affecting present business. Most large consumers have contracted for second quarter, and very little speculative covering is therefore reported. Miscellaneous business, however, is on the uptrend, with expanding railroad tonnage particularly encouraging.

Rails and Track Accessories

Bids are being taken this week on about 10,000 tons of rails and companion fastenings for the Norfolk & Western. Other important railroad business pending includes about 40,000 tons of rails and accessories for the Baltimore & Ohio. No action has thus far been reported on prices for rails and track accessories. It is considered likely, however, that tie plates and spikes will be advanced soon. Whether similar action will be taken on steel rails is not assured. It is pointed out, however, that the bulk of railroad buying, sponsored by Government funds, has been accomplished, and further rail and accessory business will be largely confined to private negotiations. Hence, rail makers and manufacturers of kindred products will be free from Government

pressure. If the carriers continue to experience a steady pickup in carloadings, additional replacements of rails and track equipment will probably be a further stimulant in this market within several months.

Bars

Soft steel bars will be established on April 14 at 1.90c., Pittsburgh, \$3 a ton over the present quotation. A fairly substantial tonnage has been driven in by the prospective mark-up, with bookings representing a well diversified consumer demand. Automotive tonnage is apparently pursuing a course contrary to general business, a slight diminution being noticed in the past week. Bar demand from the carriers has not yet reached the peak, and the large amount of railroad business still to be placed continues to be a bright spot in the present outlook.

Although an advance on billet steel reinforcing at Pittsburgh is being contemplated, no announcement has thus far been reported. In the meantime, mills are relying chiefly upon specifications for Federal, State and municipal projects. Sewage systems in and near Columbus, Ohio, are being planned, and may take as much as 30,000 tons of reinforcing bars. Specifications, however, have not definitely taken shape, and pre-estimates of bar requirements are by no means accurate. Little support is offered by road construction, which had been expected to be an important factor when mild weather appeared.

Cold Finished Steel Bars

With practically all cold-finishers covered for their second quarter hot-rolled bar requirements at the present base of 1.75c., Pittsburgh, no revision will be made for this quarter in the present cold-finished price of 2.10c., Pittsburgh. Continued improvement, though slight, in miscellaneous tonnage is reported. Some support is also noticed as a result of improved activity in the manufacture of business machines. Demand from the automotive industry has evidently leveled off. Jobber demand is notably lagging.

Plates and Shapes

These products will be marked up \$3 a ton, to become effective early next week. The new basis will be 1.85c., Pittsburgh. In spite of the prospective price advance, plate tonnage is coming in in rather restricted volume. A large tonnage for railroad car building is in the offing, but present quotations on plates for that work are probably being held applicable until these construction programs get under way.

Structural mills are experiencing only a minor pickup in tonnage in anticipation of a price increase. Outstanding projects are being protected only for a reasonable period, and in some cases, tentative orders are being requested. Bridge work again ac-

counted for a major share of structural steel tonnage contracts in the past week, with a few private enterprises reported. New work is featured by a railroad bridge to be constructed over Buzzards Bay, Mass.; contracts for this work will be let by the War Department. Extensive bridge construction in Illinois will require about 3300 tons.

Sheet Piling

An advance of \$3 a ton, to become effective April 16, is slated, which will establish the Pittsburgh base at 2.15c. a lb.

Tubular Products

Prospects for price changes on pipe are indefinite. Some changes are being considered, however, particularly in view of the impending \$2 a ton advance on skelp. Meanwhile, consumers are generally apathetic. Interest in oil country goods continues to lead demand for other tubular products. Line projects of important scope are generally in their early stages, and will offer little specific aid to pipe schedules in the next several months. Mechanical tubing is in fair demand, as are boiler tubes.

Wire Products

The new prices, embodying advances of \$3 to \$6 a ton, will become effective on April 12. Consumers have been taking advantage of the opportunity to cover at current quotations, and tonnage booked in the past week represents a definite improvement over business in the first quarter. This anticipatory tonnage will provide some much needed work to wire mills, which have been straggling behind other steel departments. The merchant wire trade has not been so active in recent buying as have other sources of business.

Sheets

With the new sheet prices to apply April 16, contracting at the current bases is very brisk, with tonnage well diversified. Automotive demand is holding up, as is demand from manufacturers of electrical equipment. Export business for automobile sheets is also encouraging, with improvement in that direction ascribable partly to the exchange situation. The recent heavy contracting has not yet benefited rolling schedules, and sheet mills are only maintaining their recent average rate of 55 per cent of capacity.

Tin Plate

Specifications in the past week have been in sufficient volume to maintain operations at the recent rate of about 80 per cent. In some cases, producers have enough forward releases to assure the present rate for at least three or four weeks. Early crop reports are encouraging, and expectations of sustained activity are exceptionally optimistic. Export demand is contributing moderately to the present volume

of business. An advance of \$8 a ton on long ternes will probably go into effect either late this week or early next week. This advance would make the Pittsburgh base 3.65c. a lb.

Strip Steel

The new prices of 2c. for hot-rolled and 2.80c. for cold-rolled strip steel, at Pittsburgh, will probably be generally in effect on April 16. In the meantime, contracting at current prices has been fairly heavy, and by the time the advanced quotations are established very little second quarter tonnage will remain to be placed. Recent demand has been well spread, with automobile makers, agricultural implement and business machine manufacturers participating. Strip mills will likely maintain average operations of 60 per cent this week.

Coke and Coal

Since the tentative advances of 25c. a ton on bituminous coal and 35c. on all grades of coke became effective, demand has diminished. Undoubtedly many consumers anticipated the advances and covered ahead to the limit of capital resources. As regards foundry coke, an exceptionally small demand exists. Furnace coke is likewise very quiet, although some blast furnace demand is in the making. A large soft coal producer has established an increase on bituminous coal of 20.9c. a ton. Other operators, however, have made no change in the recent increase of 25c. New bituminous price schedules are expected to be set up about April 15. If the 25c. advance, now in effect, is maintained, coke producers are of the opinion that a further upward revision in coke prices will be necessary. The present advance hardly takes into consideration the higher oven labor cost which had to be absorbed beginning April 1.

Scrap

A small independent mill has purchased 3000 to 4000 tons of No. 1 heavy melting steel at \$14.25, delivered. The quotational range for ordinary No. 1 steel is therefore unchanged at \$14.00 to \$14.50. The bulk of the 3400 tons of No. 1 steel on the last Pennsylvania Railroad list brought \$14.85, with a small tonnage having realized \$15.25. A sale of No. 2 steel at \$12.75 has established the range of this grade at \$12.50 to \$13.00. Consumer interest has not yet broadened to the extent that had been expected. Although open-hearth activity in this district is on an up-trend, consumers are not openly eager to buy scrap in anticipation of increased steel output. On the other hand, present offers of brokers are apparently not tempting yard dealers to part with more than moderate tonnage of scrap. The higher prices paid for No. 1 steel on the Pennsylvania list constitute the only bullish omen in the present market. A 10,000-ton sale of heavy breakable cast at \$12, delivered, was reported today.

This sale has lowered the range for heavy breakable to \$11.50 to \$12. Cupola cast, though soft, remains unchanged. A sale of machine shop turnings to a nearby mill at \$11 during the past week justified the present price range of \$10.50 to \$11.

Warehouse Business Gains on Coast

SAN FRANCISCO, April 9.—Price advances now being announced on most products are attributed to recent wage increases rather than to greater demand, although industrial buying has been heavier with the start of the second quarter. Warehouse business has shown strong gains within the last month.

Although bids are to be taken soon on several Federal projects in the Northwest, new inquiries reported during the week have been less than during any week in 1934. A bridge for the Alaska Road Commission at Juneau, Alaska, will require 1200 tons of structural steel. Specifications of the Metropolitan Water District at Los Angeles for tunnel liners and supports call for 2500 tons of plates and 600 tons of structural steel.

While awards were limited in number, 2900 tons of reinforcing bars for Boulder Dam has been placed with Truscon Steel Co. by the Bureau of Reclamation at Denver. W. S. Wetenhall Co. has been awarded 575 tons of reinforcing bars for the Park Street bridge in Oakland, Cal.

Pig Iron Up \$1 a Ton In Boston

BOSTON, April 10.—The Mystic Iron Works yesterday filed notice of an advance of \$1 a ton in pig iron prices. No. 2 foundry is now \$19.50 a ton, Everett. Previously, \$1 a ton advances had been announced by eastern Pennsylvania and Alabama furnaces represented in the New England territory. Pig iron sales last week aggregated close to 3000 tons. Purchases were in anticipation of higher prices and were comparatively small, individually. Around 1000 tons is awaiting furnace confirmation.

Buying of scrap for Pittsburgh and Worcester, Mass., delivery has expanded, but the market is by no means active, although sufficiently so to establish prices which average a little lower than a fortnight or so ago. No. 1 heavy melting steel for Pittsburgh district delivery has been sold at \$7.75 to \$8 a ton, on cars shipping point, and for Worcester delivery at \$7.50 to \$7.75. Steel turnings have not brought better than \$4 a ton on cars of late, off 25c. to 50c. from previously quoted prices. Breakable cast for local delivery is \$8.50 a ton delivered, and for eastern Pennsylvania about \$7.

Bookings Mount in the Chicago District



Steel Sellers Concerned About Ability to Meet Shipping Dates — Pig Iron Contracting Extraordinarily Heavy — Ingot Output Rises

CHICAGO, April 10. — Price advances hold the center of the stage, though only a few of them are effective, inasmuch as sellers are allowing the 10-day notice following date of filing. The effects of the general price advance are somewhat startling. In the first place, there is a pronounced swing away from hand-to-mouth buying, with the result that order books are growing by leaps and bounds. In some instances bookings for second quarter are from two to three times the volume written for the first quarter. Some books have grown to such proportions that sellers eye with concern their ability to meet shipping dates, should consumers bunch releases near the end of the quarter. On this account, consumers are being urged to anticipate needs and release June requirements before the end of April. While it is generally claimed that there is little speculation, and code terms give this view plausibility, yet buyers' natures have not changed and their impulse is to seek protection against higher material costs.

Releases for immediate shipment have gained sufficiently to push ingot output up about three points to an average of 50 per cent of capacity.

Scrap purchases have been notably heavy and most major consumers can safely remain out of the market for a month to six weeks.

Pig Iron

New prices for Northern foundry iron were filed April 6 to take effect April 16, the advances being \$1 a ton, making the furnace price at Chicago \$18.50 for the No. 2 grade. Buying has been heavy and many users that had been confining purchases to immediate needs have gone back to the contract way of doing business. March contracts proved to be far heavier than the total in December. Prices for charcoal iron are unchanged. Stocks are shrinking and several furnace operators contemplate going back into production in the very near future.

Wire Products

Most producers have filed higher prices on wire and wire products, while others are still watching developments. In general, wire advances

are \$3 a ton and nails and staples are being stepped up \$5 a ton. The rush of consumers to cover second-quarter needs before being caught in the mesh of advancing prices is near an end and mills have heavy order books. Consumption continues to gain and output has advanced to a range from 40 to 45 per cent of capacity. There is a somewhat better call for wire products from rural areas.

Cold-Rolled Strip

Forward contracting has been heavy and shipments are increasing. Sellers, in viewing their heavy books and rising shipments, are urging users to enter June specifications before the end of April, a move designed to forestall extreme pressure for material near the end of the quarter.

Rails and Track Supplies

The Great Northern has formally placed 20,000 tons of rails, 75 per cent of which was taken by Chicago district mills. About 8000 tons of track supplies has been ordered during the week, the bulk of the tonnage having been placed by the Great Northern. Rail mills in this district have been maintaining a steady pace for about three weeks and it now appears to be the aim of producers to hold this rate over the next few weeks and possibly beyond, should pressure from the railroads not become too severe.

Structural Material

Most mills have filed new prices at advances of \$3 a ton, thereby bringing the structural shape price up to 1.90c. a lb., Chicago. Awards are unimpressive at about 2500 tons, the bulk of this tonnage being for State highway bridges. Inquiries, at about 10,000 tons, include 5000 tons for a chemical plant to be built in the South. Many small inquiries are for highway bridges scattered from Illinois to the Rocky Mountain region. The State of Illinois is rapidly opening up a large bridge program, bids having been opened on 2600 tons. Bids will be opened on a like tonnage in the next few days.

Plates

This commodity is being marked up \$3 a ton to 1.90c. a lb., Chicago. Five oil storage tanks to be erected at East Chicago, Ind., call for 1300 tons

and inquiries are out for several water supply tanks. The Texas Corp'n. will build a new dock at the south end of Lake Michigan and may have need for tank capacity at that point. The Chicago Great Western is one step nearer the purchase of 500 freight cars, having issued a formal inquiry.

Bars

New prices for bars were filed April 8, the advances being \$3 a ton to 1.95c. a lb., Chicago or Gary. Forward commitments have been heavy and specifications have climbed to a higher level. Early termination of the strike at the Nash plants is expected. Employees at the Racine plant have already approved an agreement with the company.

Reinforcing Steel

Jobbers have been busily engaged making purchases for second quarter needs. This movement is in anticipation of higher prices to be asked by mills. New quotations have not as yet been filed by producers, but it is commonly expected that \$2 to \$3 a ton will very soon be added to the present mill schedules for both new billet and rail steel reinforcing bars. Awards look quite promising, but inquiries continue to drag. Shops are benefiting in a small way from releases for road work. Shop operations have gained several points to a range from 25 to 30 per cent of capacity.

Cast Iron Pipe

This market continues to drift, pending the release of Government funds. The Sanitary District, Chicago, is completing old projects started several years ago and contractors are releasing tonnages against old orders, placed at that time. The United States Pipe & Foundry Co. is low bidder on a round tonnage at Cincinnati.

Scrap

Not less than 125,000 tons of steel mill scrap has changed hands in the week in the Chicago area, and local dealers estimate that fully a half million tons has been contracted for throughout the country. At Chicago the average price was \$12 a gross ton, delivered consumers' yards. This is somewhat of an average price, it being conceded that the price was exceptionally good on that part of the tonnage which consisted of automobile scrap while the railroad grade did not bring as much as dealers had expected. Transactions of the size recorded are looked upon by the trade as a stabilizing factor. It is admitted that most steel mills will be out of the market for five to six weeks, thereby leaving the market in the hands of brokers. Automobile heavy melting steel is playing an increasingly important part in the market. Fully one-third of the recent movement is classified as automobile heavy melting steel.

Contracting Is Heavy In New York District



**Buyers Hasten to Cover Before Price
Advances Become Effective — D. L.
& W. Buys 500 Cars and 20 Locomotives**

NEW YORK, April 10.—Contracting for the second quarter has grown very heavy as buyers have hastened to cover their needs before advanced prices go into effect. Because of the delay of some producers in filing new quotations, most of the advances will not become effective until April 14 and some will not go into effect until April 17. Most of the finished steel contracts being written are of the requirement type, under which a buyer places a definite percentage of his needs, up to a stated maximum tonnage, with a given mill. The difficulty with this type of contract is that buyers find it hard to foresee their requirements and are likely to set a high maximum to be on the safe side. As a result, mills are having difficulty in estimating the tonnage on their books, realizing that in many cases they have committed themselves for possibilities rather than for definite amounts.

Another complication is the ambiguity of the average requirement contract, which stipulates that approximately one-third of the maximum needs of a customer must be "taken out" each month in the quarter. It is uncertain whether "taking the tonnage out" means actually receiving shipments during the month or merely filing specifications. If the latter interpretation is correct, a customer could send in April specifications calling for May or even June delivery. In case shipments should be generally deferred until late in the quarter the mills might find it difficult to make complete shipments before July 1.

No advances on steel pipe have yet been announced, but the filing of increases is an early probability. Tin plate prices are not likely to be raised, but stock in tin plate has been boosted from \$4.55 to \$4.90 a base box, Pittsburgh. Cold-finished steel bars, according to present indications, will not be raised this quarter, as makers are covered on their raw material for that period at unchanged prices.

Delaware, Lackawanna & Western has placed 350 hopper cars with American Car & Foundry Co., 150 with Magor Car Corp., and 20 locomotives with American Locomotive Co. The cars alone will call for close

to 7000 tons of plates, shapes, bars and wheels. Most of the steel for the Van Sweringen lines' equipment has now been distributed among the mills. Fabrication of the towers of the Triborough bridge, New York, has been resumed after having been temporarily suspended pending a revision of plans. For the Midtown tunnel, New York, additional work amounting to 465 tons has been awarded to the Alco Co. A contract for a branch store addition for Sheffield Farms Co., Inc., 125th Street, New York, calling for 670 tons, has been let to F. G. Schaefer Iron Works.

Pig Iron

The Swedeland, Pa., and Everett, Mass., furnaces have filed \$1 a ton advances with the Institute on all common grades of iron which will be effective April 16 and 19 respectively. No increases have yet been announced by low phosphorus, silvery or ferrosilicon producers, but the trade believes that these grades will soon be marked up. Naturally, consumers are endeavoring to protect themselves by purchasing for May-June shipment, and total contract sales during the past seven-day period expanded sharply to 17,000 tons, against 5100 tons in the previous week, and 4300 tons reported two weeks ago. In addition to the small spot business always in the market, a few of the larger melters are considering additional purchases. Nevertheless, the commitments of the past fortnight represent the bulk of second and early third quarter requirements for this district, and unless melting schedules soon improve considerably there probably will be very little new inquiry in this market after the next few weeks.

Reinforcing Steel

No new prices have been filed, but a \$3 a ton advance is expected soon by distributors. Awards last week consisted of a number of small tonnages in addition to 200 tons secured by Concrete Steel Co. and 120 tons sublet to Kalman Steel Co. for Pennsylvania road work. Pending jobs include 230 tons for two buildings in Massachusetts and about 400 tons for which the Pennsylvania Highway Department is inquiring.

Scrap

The recent buying movement in the West has not as yet influenced eastern Pennsylvania mills to purchase heavily, and, therefore, local brokers continue to devote most of their attention to the variety of export business which is available. Most purchases in this district are against foreign contracts, and very little No. 1 and No. 2 steel can be obtained under the export basis of \$9.50 and \$8 a ton respectively. A good lot of scrap rails was recently bought at \$10 a ton, which was 75c. above previous transactions, but all other grades are unchanged and steady. Bethlehem is moving canal shipments to Buffalo, and is accumulating steel and cast grades for additional water shipments to the Lackawanna and Sparrows Point, Md., plants. All of the more usual foreign buyers are now actively in the market as prices here show signs of advancing, and several English and German producers recently contracted for moderate tonnages.

Wagner Bill Disturbs Business at Cincinnati

CINCINNATI, April 10.—The customary haste to cover preceding price advances swelled pig iron bookings to near 7000 tons the past week. Immediately following these heavy bookings, quotations on both Northern and Southern iron went up \$1 a ton. The new Northern price is \$19.51, Cincinnati, and the Southern \$19.13. Foundry operations generally are still uncertain, many fearing the outcome of the Wagner bill. Some automotive and one or two stove foundries, however, are melting at a rate well in advance of the market level, but this is exceptional. Although current bookings are large, furnace interests indicate that consumers are not buying more than enough to care for second quarter needs at present low rates of operation.

Coke

The code question continues to complicate the coke market. Northern coke is still quotable at \$9.30, Cincinnati, but Birmingham representatives have been ordered to withdraw from the market until recent code authority orders for wage boosts are analyzed.

Steel

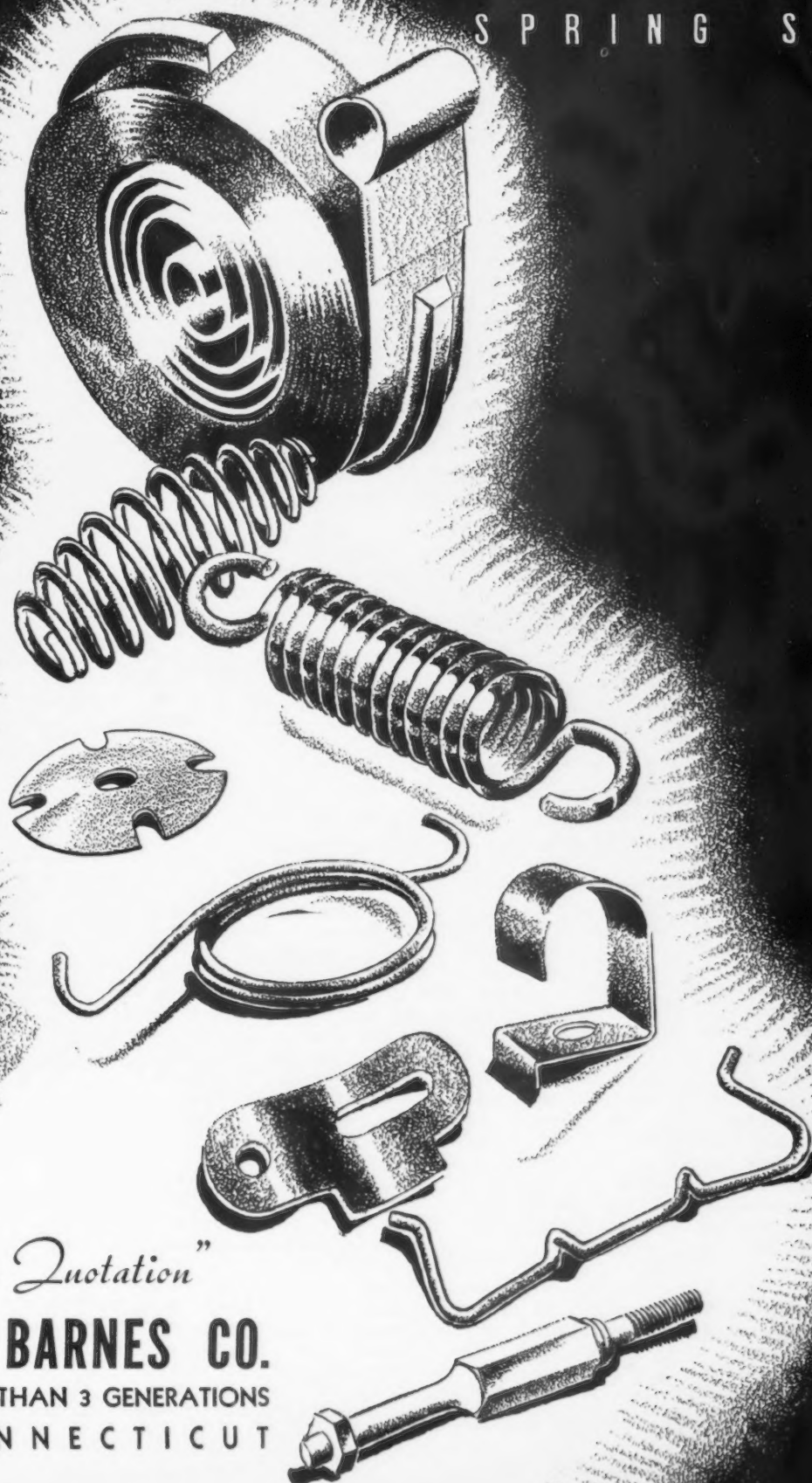
Sheet specifications are easing off as consumption seeks a more certain level. Automotive ordering reflects renewed vigor in that field, while household equipment manufacturers maintain a better demand than a year ago.

Scrap

Shipments of scrap have increased, but inability of mills to handle material has forced embargoes at certain plants.

Barnes-made SPRINGS

SMALL STAMPINGS
SCREW MACHINE PRODUCTS
SPRING STEEL



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SPRINGMAKERS FOR MORE THAN 3 GENERATIONS
BRISTOL CONNECTICUT

Cleveland and Other Lake Furnaces Advance Prices



Heavy Forward Covering in Both Pig Iron and Steel Follows Announcement of Advances—Ingot Rate Rises

CLEVELAND, April 10.—Buying of finished steel products in heavy volume for the second quarter has continued since the price advances announced a week ago, and most consumers are now under contract. Consumers not yet covered have the remainder of the week to place contracts, as the new prices on most products become effective April 16. Some consumers, whose requirements are very small and who do not make quarterly contracts, have placed orders for definite tonnages covering their estimated requirements for the remainder of the quarter to retain the advantage of present prices. The price advances have also stimulated current orders and specifications against contracts previously placed, resulting in an increase in tonnage booked during the week.

A \$1 a ton price advance has been made on pig iron by Lake furnaces and this has stimulated sales. Practically all consumers are expected to be under cover before the advance becomes effective. No advance has been announced as yet on Ohio silvery iron.

Ingot output in the Cleveland-Lorain territory has rebounded two points this week, and is now 58 per cent of capacity, one additional open-hearth furnace being put on in Lorain. Some steel producers already are fearing a severe congestion in June from a rush of orders for steel to be delivered against expiring contracts and are urging their consumers to get in specifications for April rolling in anticipation of future requirements. Sheet mills, particularly, are expected to be badly crowded toward the end of the quarter.

Additional price advances not yet announced are looked for on alloy steel bars and reinforcing bars. Rivet manufacturers have advanced prices \$5 a ton. Bolt and nut prices so far are unchanged. No advance is scheduled for cold-rolled steel bars. Lake ore prices, according to present strong indications, will not be marked up.

Pig Iron

A price advance of \$1 a ton has been made by Cleveland and other Great Lakes furnaces, making the furnace base \$18.50 on foundry and malleable grades in Cleveland, Toledo, Detroit and Chicago. The advance becomes ef-

fective April 16. Stimulated by the expectation of higher prices following the wage advance, sales increased during the week and the market is expected to become still more active this week now that the advance has been announced. A local interest sold 10,000 tons during the week in small lots. Large lot orders are looked for this week from some of the motor car foundries. It is expected that by the end of the week practically all consumers will have covered for the remainder of the quarter and that practically no new tonnage will come out from April 16 until books are opened June 1 for the third quarter.

Iron Ore

Present ice conditions in Northern waters indicate that the season of navigation will not open before May 1, or somewhat later than usual. Some consumers have about used up their supply of certain grades of ore and will need early cargoes. Shipments from Lake Erie docks during March were 204,900 tons, as compared with 35,083 tons during the same month last year. The dock balance April 1 was 4,981,536 tons as against 5,070,768 tons on the same date a year ago.

Bars, Plates and Shapes

Most contract buyers have covered for the remainder of the quarter. Steel bar contracting has been fairly heavy. With the \$3 a ton advance, the Cleveland base on merchant bars will be 1.95c. Consumers generally have held their contracts to the amount of their expected requirements for the quarter. Both new billet and rail steel reinforcing bars are expected to be marked up, new prices not yet having been named. With little public work coming out, activity in the construction field is very light.

Bolts, Nuts and Rivets

A \$5 a ton advance on large rivets to \$3 per 100 lb., Cleveland, and \$3.10, Chicago, has been announced, effective April 16. The Birmingham price, now the same as Chicago, will be \$1 a ton higher, or \$3.15. Small rivets will be advanced 5 points to 70 and 5. With most consumers under contract, the new prices will apply to little business during the remainder of the quarter. While bolt, nut and rivet manu-

facturers will not be affected for some time by the advance in steel prices, manufacturers of these products generally advanced wages 10 per cent April 2, thus increasing their production costs. Bolt and nut makers have not yet made a decision regarding a price advance. A code not having yet been adopted, this industry is still operating without any price control and the regular 70 per cent discount has not been firmly maintained recently. Demand for bolts and nuts is broadening. Orders have improved from railroads and some business is now coming from the agricultural implement industry.

Sheets

The price advance of from \$5 to \$8 a ton announced last week has been followed by a rush by consumers to get under contract for the remainder of the quarter, and it is expected that there will be very few buyers uncovered April 16 when the new prices become effective. Some of the mills already have made commitments for all the tonnage of some grades they can roll during the quarter, provided consumers take out the maximum tonnages covered by their contracts. Vitreous enameling sheets have been advanced \$6 a ton to 3.20c., Pittsburgh, for No. 20, and \$3 a ton to 2.60c. for No. 10.

Strip Steel

Consumers in the automotive field have placed contracts for large tonnages since the announced advance of \$5 a ton on hot strip and \$8 a ton on cold-rolled strip. The quantities purchased indicate that these consumers expect present production schedules will be well maintained through the quarter. Fender stock has been advanced \$8 a ton to 3.50c. for No. 20, and \$5 a ton to 3.20c. for 16-gage and heavier.

Scrap

While there has been some new buying by consumers in other territories, activity in this section has been confined to a purchase of heavy melting steel by a Youngstown district mill, which paid \$14.25 and \$14.50 for No. 1 scrap and 75c. less for No. 2. The local situation has been improved by the release of open-hearth scrap by one of the consumers which recently has been taking only blast furnace scrap. The first water shipment of scrap for the season reached Lorain from Detroit late last week. Prices are firm and unchanged.

Pig Iron Contracting Active at Buffalo

BUFFALO, April 10.—An increase of \$1 a ton on Buffalo pig iron has been announced to become effective April 16. This will bring the price for No. 2 plain to \$18.50 and for malleable, \$19. With the price rise in the offing, bookings have gained in volume,

and it is probable that between 10,000 and 15,000 tons has been sold by Buffalo makers.

Mill operations are being maintained at the same pace as last week, with no immediate prospect of change.

Reports are current that two mills purchased No. 1 heavy melting steel and No. 2 heavy melting steel scrap during the past week, but these reports have not been verified. Another concern has bought a considerable tonnage of stove plate at \$11 and cupola cast at \$12. A mill which has made extensive purchases in the last two weeks has ordered some of the larger shippers to restrict shipments.

Rise in Prices Stimulates Interest in South

BIRMINGHAM, April 10.—Pig iron and steel producers in this district filed new price schedules last Friday. Pig iron was advanced \$1 a ton, and the new price is to be \$14.50, Birmingham. Sheet prices went up \$5 to \$8 a ton. No. 10 hot rolled was increased \$5 a ton, the new quotation to be 2.15c. instead of 1.90c. a lb., Birmingham. The increases on No. 24 hot-rolled annealed and No. 24 galvanized were \$8 a ton, with the former advancing from 2.40c. to 2.80c. a lb., Birmingham, and the latter from 3c. to 3.40c.

Pig Iron

Sales have been more or less sluggish for the last several weeks, but the higher price, which will go into effect ten days after filing, is expected to develop a considerable amount of forward tonnage, as foundries cover their requirements for the quarter. During this period tonnage will be taken at \$13.50.

Ten blast furnaces continue in operation. The first change since late January took place last week when the Tennessee company switched its Ensley No. 5 from ferromanganese to basic and foundry.

Steel

Last week brought a better volume of miscellaneous business as buyers began to cover more liberally for the quarter. New tonnage was mostly in small lots, but the aggregate for general products was better. The increased prices now pending are expected to cause further covering during the present week.

Thirteen open-hearths operated last week and the same number will likely run this week. Tennessee company now has five at Ensley, and five at Fairfield; Gulf States Steel has three at Alabama City.

Cast Iron Pipe

There is still no general pickup in pipe.

With the increase in pig iron prices,

and the upward revisions in wages made in recent weeks, it is likely that pipe prices will be raised shortly. For the present, business is still being taken at \$36 to \$37.

Heavy Forward Covering At St. Louis

ST. LOUIS, April 10.—Announcement of advances on finished steel has started a strong buying movement, users being eager to cover their requirements on the old prices. Except in the case of structural shapes, specifications have been light.

The St. Louis Car Co. is low bidder on 700 tons of plates for pontoons, and Bartlett, Hayward & Co. are low bidders on 1200 tons of electric welded pipe required for the United States Engineer's office at Memphis. McClintic-Marshall Corp. has been awarded 780 tons of discharge pipe

for a Government project at Fort Peck, Mont.

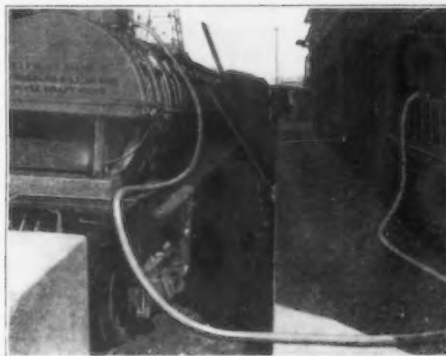
Notice of an increase of \$1 a ton in the price of pig iron in the East stimulated purchases in this district, although buying had been heavy during the last few weeks in anticipation of an advance.

The American Steel Foundries plant at East St. Louis, which has been closed since Oct. 26, 1932, will resume April 16 with one furnace in operation. Only railroad castings are made.

Mills in this district are said to be well supplied with scrap for the next 60 to 90 days, and not much new buying is expected for a month. Some scrap is moving to outside points. The movement of country scrap is rather free. Selected heavy melting steel, No. 2 heavy melting, miscellaneous standard-section rails and cast iron carwheels are 25c. a ton lower, and No. 1 machinery cast is off 50c. a ton.

In unloading an acid tank car Safety comes first, doesn't it?

Free of explosion
hazards no
endangering of
life or property



With Safety assured, time of unloading is the next factor: "the sooner the quicker" — and cheaper.

That's where Duriron Centrifugal Pumps fit into the picture.

Here's an actual case that can be duplicated in your plant:

To unload a tank car by air pressure took about seven hours and required that two men be on duty, watching, all that time.

With a Duriron No. 2E Centrifugal Pump, a tank car now is unloaded in 1½ hours at the most. And so far as the operation is concerned, no one need watch it.

Now, where do you get off using air?

Send for bulletins

THE DURIRON COMPANY, Inc.
438 N. Findlay St. Dayton, Ohio

Prices of Finished and Semi-Finished Steel, Coke, Coal, Cast Iron Pipe

BARS, PLATES, SHAPES

Iron and Steel Bars	
Soft Steel	
Base per Lb.	
F.o.b. Pittsburgh mill	1.75c.
F.o.b. Chicago or Gary	1.80c.
Del'd Philadelphia	2.04c.
Del'd New York	2.08c.
F.o.b. Cleveland	1.80c.
Del'd Detroit	1.90c.
F.o.b. Buffalo	1.85c.
F.o.b. Birmingham	1.90c.
F.o.b. cars dock Pacific ports	2.30c.
F.o.b. cars Gulf ports	2.15c.

Rail Steel	
(For merchant trade)	
F.o.b. Cleveland	1.70c.
F.o.b. Chicago	1.70c.
F.o.b. Gary	1.70c.
F.o.b. Pittsburgh	1.65c.
F.o.b. Buffalo	1.75c.
F.o.b. Birmingham	1.80c.

Billet Steel Reinforcing	
(Cut lengths as quoted by distributors)	
F.o.b. Pittsburgh mill	1.90c.
F.o.b. Birmingham	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Cleveland	1.95c.
Del'd Detroit	2.05c.
F.o.b. Youngstown	1.95c.
F.o.b. car dock Pacific ports	2.35c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. Chicago	1.95c.

Rail Steel Reinforcing	
(Cut lengths as quoted by distributors)	
F.o.b. Pittsburgh	1.75c.
F.o.b. Cleveland	1.80c.
F.o.b. Chicago	1.80c.

Iron	
Common iron, f.o.b. Terre Haute, Ind.	1.60c. to 1.75c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	1.80c.
Common iron del'd New York	1.93c.

Steel Car Axles	
F.o.b. Pittsburgh	2.50c.
F.o.b. Chicago	2.50c.

Tank Plates	
Base per Lb.	
F.o.b. Pittsburgh mill	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Birmingham	1.85c.
Del'd Cleveland	1.85c.
Del'd Philadelphia	1.85c.
F.o.b. Coatesville	1.80c.
F.o.b. Sparrows Point	1.80c.
Del'd New York	1.98c.
F.o.b. dock cars Pacific ports	2.25c.
F.o.b. cars dock, Gulf ports	2.10c.
Wrought iron plates, f.o.b. P'gh	3.00c.

Floor Plates	
F.o.b. Pittsburgh	3.20c.
F.o.b. Chicago	3.25c.

Structural Shapes	
Base per Lb.	
F.o.b. Pittsburgh mill	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Birmingham	1.85c.
F.o.b. Buffalo	1.80c.
F.o.b. Bethlehem	1.80c.
Del'd Cleveland	1.85c.
Del'd Philadelphia	1.90c.
Del'd New York	1.95c.
F.o.b. cars dock, Gulf ports	2.10c.
F.o.b. dock cars Pacific ports (standard)	2.25c.
F.o.b. dock cars Pacific ports (wide flange)	2.35c.

Steel Sheet Piling	
Base per Lb.	
F.o.b. Pittsburgh	2.00c.
F.o.b. Chicago mill	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Alloy Steel Bars	
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	
Open-hearth grade, base, 2.45c. a lb. except at Bethlehem where the price is 2.55c.	
Delivered price at Detroit is 2.60c.	

S.A.E. Series	
Numbers	
2000 (1/4% Nickel)	\$0.25
2100 (2 1/4% Nickel)	0.55
2300 (3 1/4% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum) (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.20
4100 Chromium Vanadium Spring Steel	0.95
Chromium Nickel Vanadium	1.50
Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars is 1/2c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2 1/2 in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.	
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Cold Finished Bars *	
Base per Lb.	
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.15c.
Bars, Cleveland	2.15c.
Bars, Buffalo	2.20c.
Bars, Detroit	2.30c.
Bars, eastern Michigan	2.35c.
Shifting, ground, f.o.b. mill	1 1/4 in. 3.40c.
	1-3/16 to 1 1/2 in. 2.90c.
	1-9/16 to 1 3/4 in. 2.75c.
	1-15/16 to 2 1/4 in. 2.60c.
	2-15/16 to 6 in. 2.45c.

SHEETS, STRIP, TIN PLATE	
TERNE PLATE	
Sheets	
Hot Rolled	
Base per Lb.	
No. 10, f.o.b. Pittsburgh	1.75c.
No. 10, f.o.b. Gary	1.85c.
No. 10, del'd Detroit	1.95c.
No. 10, del'd Phila.	2.04c.
No. 10, f.o.b. Birmingham	1.90c.
No. 10, f.o.b. dock cars Pacific ports	2.42 1/2c.

Hot-Rolled Annealed	
No. 24, f.o.b. Pittsburgh	2.25c.
No. 24, f.o.b. Gary	2.35c.
No. 24, del'd Detroit	2.45c.
No. 24, del'd Phila.	2.54c.
No. 24, f.o.b. Birmingham	2.40c.
No. 24, f.o.b. dock cars Pacific ports	2.95c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled	
No. 10 gage, f.o.b. Pittsburgh	2.30c.
No. 10 gage, f.o.b. Gary	2.40c.
No. 10 gage, del'd Detroit	2.50c.
No. 10 gage, del'd Phila.	2.59c.
No. 10 gage, f.o.b. dock cars Pacific ports	3.00c.

Light Cold-Rolled	
No. 20 gage, f.o.b. Pittsburgh	2.75c.
No. 20 gage, f.o.b. Gary	2.85c.
No. 20 gage, del'd Detroit	2.95c.
No. 20 gage, del'd Phila.	3.04c.
No. 20 gage, f.o.b. dock cars Pacific ports	3.45c.

Galvanized Sheets	
No. 24, f.o.b. Pittsburgh	2.85c.
No. 24, f.o.b. Gary	2.95c.
No. 24, del'd Phila.	3.14c.
No. 24, f.o.b. Birmingham	3.00c.
No. 24, f.o.b. dock cars Pacific ports	3.55c.
No. 24 Wrought iron Pittsburgh	4.95c.

Long Ternes	
No. 24, unassorted 8-lb. coating	f.o.b. Pittsburgh 3.25c.
No. 20, f.o.b. Pittsburgh	2.90c.

Vitreous Enameling Stock	
No. 28, f.o.b. Pittsburgh	2.65c.
No. 28, Gary	2.75c.

Tin Mill Black Plate	
No. 28, f.o.b. Pittsburgh	2.65c.
No. 28, Gary	2.75c.

Tin Plate	
Base per Box	
Standard cokes, f.o.b. P'gh district	\$5.25
Standard cokes, f.o.b. cars dock	5.35
Pacific ports	5.90

Terne Plate	
(Per Package, 20 x 28 in.)	
8-lb. coating I.C.	\$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under 1/4 in.	
Base per Lb.	
All widths up to 24 in., P'gh	1.75c.
All widths up to 24 in., Chicago	1.85c.
All widths up to 24 in., del'd Detroit	1.95c.
Cooperage stock, Pittsburgh	1.85c.
Cooperage stock, Chicago	1.95c.

Cold-Rolled Strips	
F.o.b. Pittsburgh	2.40c.
F.o.b. Cleveland	2.40c.
Del'd Chicago	2.60c.
F.o.b. Worcester	2.60c.

Fender Stock	
No. 20, Pittsburgh or Cleveland	3.10c.

WIRE PRODUCTS	
(Carload lots, f.o.b. Pittsburgh and Cleveland)	
To Manufacturing Trade	Per Lb.
Bright wire	2.20c.
Spring wire	3.20c.
To Jobbing Trade	
Extras of 10c. a 100 lb. on joint carloads and 30c. on pooled cars and less-than-carload lots are applied on all merchant wire products. An allowance of \$2 a ton is made to jobbers on straight, mixed or joint carloads; \$3 a ton is allowed on less-than-carload shipments.	

Standard wire nails	
Smooth coated nails	\$2.35
Galvanized nails:	
15 gage and coarser	4.35
16 gage and finer	4.85

Smooth annealed wire	
Smooth galvanized wire	\$2.35
Galvanized staples	3.05
Barbed wire, galvanized	2.85
Woven wire fence, base column	60.00

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are \$2 a ton over Pittsburgh (except for woven wire fence at Duluth which is \$3 over Pittsburgh), and Birmingham mill prices are \$3 a ton over Pittsburgh.	
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STEEL AND WROUGHT PIPE AND TUBING	
Welded Pipe	
Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills	
Butt Weld	
Steel	
Inches	Black Galv.
1/4	51 1/2
3/8	57 3/8
1/2	62 5/8
3/4	68 1/2
1	74 1/2
1 1/4	80 1/2
1 1/2	86 1/2
2	92 1/2
2 1/2	98 1/2
3	104 1/2
3 1/2	110 1/2
4	116 1/2
4 1/2	122 1/2
5	128 1/2
5 1/2	134 1/2
6	140 1/2
6 1/2	146 1/2
7	152 1/2
7 1/2	158 1/2
8	164 1/2
8 1/2	170 1/2
9	176 1/2
9 1/2	182 1/2
10	188 1/2
10 1/2	194 1/2
11	200 1/2
11 1/2	206 1/2
12	212 1/2
12 1/2	218 1/2
13	224 1/2
13 1/2	230 1/2
14	236 1/2
14 1/2	242 1/2
15	248 1/2
15 1/2	254 1/2
16	260 1/2
16 1/2	266 1/2
17	272 1/2
17 1/2	278 1/2
18	284 1/2
18 1/2	290 1/2
19	296 1/2
19 1/2	302 1/2
20	308 1/2
20 1/2	314 1/2
21	320 1/2
21 1/2	326 1/2
22	332 1/2
22 1/2	338 1/2
23	344 1/2
23 1/2	350 1/2
24	356 1/2
24 1/2	362 1/2
25	368 1/2
25 1/2	374 1/2
26	380 1/2
26 1/2	386 1/2
27	392 1/2
27 1/2	398 1/2
28	404 1/2
28 1/2	410 1/2
29	416 1/2
29 1/2	422 1/2
30	428 1/2
30 1/2	434 1/2
31	440 1/2
31 1/2	446 1/2
32	452 1/2
32 1/2	458 1/2
33	464 1/2
33 1/2	470 1/2
34	476 1/2
34 1/2	482 1/2
35	488 1/2
35 1/2	494 1/2
36	500 1/2
36 1/2	506 1/2
37	512 1/2
37 1/2	518 1/2
38	524 1/2
38 1/2	530 1/2
39	536 1/2
39 1/2	542 1/2
40	548 1/2
40 1/2	554 1/2
41	560 1/2
41 1/2	566 1/2
42	572 1/2
42 1/2	578 1/2
43	584 1/2
43 1/2	590 1/2
44	596 1/2
44 1/2	602 1/2
45	608 1/2
45 1/2	614 1/2
46	620 1/2
46 1/2	626 1/2
47	632 1/2
47 1/2	638 1/2
48	644 1/2
48 1/2	650 1/2
49	656 1/2
49 1/2	662 1/2
50	668 1/2
50 1/2	674 1/2
51	680 1/2
51 1/2	686 1/2
52	692 1/2
52 1/2	698 1/2
53	704 1/2
53 1/2	710 1/2
54	716 1/2
54 1/2	722 1/2
55	728 1/2
55 1/2	734 1/2
56	740 1/2
56 1/2	746 1/2
57	752 1/2
57 1/2	758 1/2
58	764 1/2
58 1/2	770 1/2
59	776 1/2
59 1/2	782 1/2
60	788 1/2
60 1/2	794 1/2
61	800 1/2
61 1/2	806 1/2
62	812 1/2
62 1/2	818 1/2
63	824 1/2
63 1/2	830 1/2
64	836 1/2
64 1/2	842 1/2
65	848 1/2
65 1/2	854 1/2
66	860 1/2
66 1/2	866 1/2
67	872 1/2
67 1/2	878 1/2
68	884 1/2
68 1/2	890 1/2
69	896 1/2
69 1/2	902 1/2
70	908 1/2
70 1/2	914 1/2
71	920 1/2
71 1/2	926 1/2
72	932 1/2
72 1/2	938 1/2
73	944 1/2
73 1/2	950 1/2
74	956 1/2
74 1/2	962 1/2
75	968 1/2
75 1/2	974 1/2
76	980 1/2
76 1/2	986 1/2
77	992 1/2
77 1/2	998 1/2
78	1004 1/2
78 1/2	1010 1/2
79	1016 1/2
79 1/2	1022 1/2
80	1028 1/2
80 1/2	1034 1/2
81	1040 1/2
81 1/2	1046 1/2
82	1052 1/2
82 1/2	1058 1/2
83	1064 1/2
83 1/2	1070 1/2
84	1076 1/2
84 1/2	1082 1/2
85	1088 1/2
85 1/2	1094 1/2
86	1100 1/2
86 1/2	1106 1/2
87	1112 1/2
87 1/2	1118 1/2
88	1124 1/2
88 1/2	1130 1/2
89	1136 1/2
89 1/2	1142 1/2
90	1148 1/2
90 1/2	1154 1/2
91	1160 1/2
91 1/2	1166 1/2
92	1172 1/2
92 1/2	1178 1/2
93	1184 1/2
93 1/2	1190 1/2
94	1196 1/2
94 1/2	1202 1/2
95	1208 1/2
95 1/2	1214 1/2
96	1220 1/2
96 1/2	1226 1/2
97	123

Wire Rods (Common soft, base)

	Per Gross Ton
Pittsburgh	\$36.00
Cleveland	36.00
Chicago	37.00
Birmingham	39.00
Youngstown (del'd)	37.00

ALLOY STEEL BLOOMS, BILLETS AND SLABS

F.o.b. Pittsburgh, Chicago, Buffalo, Massillon, Canton or Bethlehem.
Base price, \$49 a gross ton except at Bethlehem, where it is \$51.
Price del'd Detroit is \$52.

CARBON STEEL FORGING INGOTS

F.o.b. Pittsburgh, Youngstown or Chicago.
Uncropped, \$28 per gross ton.

COKE, COAL AND FUEL OIL

Coke	Per Net Ton
Furnace, f.o.b. Connellsville	\$3.85
Prompt, f.o.b. Connellsville	\$4.60 to 5.60
Foundry, by-product, Chicago	8.50
Ovens, for delivery outside switching district	9.25
Foundry, by-product, delivered in Chicago switching district	10.50
Foundry, by-product, New England, delivered	8.20 to 8.81
Foundry, by-product, Newark or Jersey City, del'd	9.00
Foundry, by-product, Phila.	9.25
Foundry, by-product, Cleveland delivered	4.75
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd	9.00

Coal	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.80 to \$2.05
Mine run coking coal f.o.b. W. Pa. mines	2.05 to 2.25
Gas coal, 1/4-in. f.o.b. Pa. mines	2.25 to 2.55
Mine run gas coal, f.o.b. Pa. mines	2.05 to 2.45
Steam slack, f.o.b. W. Pa. mines	1.55 to 1.65
Gas slack, f.o.b. W. Pa. mines	1.30 to 2.10

Fuel Oil	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Fuel Oil	Per Gal. f.o.b. Baltimore
No. 3 distillate	4.00c.
No. 4 industrial	3.50c.

Fuel Oil	Per Gal. del'd Chicago
No. 3 industrial fuel oil	3.73c.
No. 5 industrial fuel oil	3.00c.

Fuel Oil	Per Gal. f.o.b. Cleveland
No. 3 distillate	5.75c.
No. 4 industrial	5.50c.

REFRACTORIES

Fire Clay Brick	Per 1000 f.o.b. Works
High-heat Intermediate Duty Brick	\$40.00
Duty Brick	45.00
Pennsylvania	45.00
Maryland	45.00
New Jersey	55.00
Ohio	45.00
Kentucky	45.00
Missouri	45.00
Illinois	45.00
Ground fire clay, per ton	7.00

Chrome Brick

Standard size	Per Net Ton
	\$45.00

Silica Brick

Per 1000 f.o.b. Works	Per Net Ton
Pennsylvania	\$45.00
Chicago	54.00
Birmingham	55.00
Silica clay, per ton	8.00

Magnesite Brick

Standard sizes, burned, f.o.b. Baltimore and Chester, Pa.	Per Net Ton
Unburned, f.o.b. Baltimore	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	55.00
Domestic, f.o.b. Chewelah, Wash.	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

CAST IRON PIPE

4-in. and larger, del'd	Per Net Ton
Chicago	\$44.00 to \$45.00
4-in. del'd Chicago	47.00 to 48.00
4-in. and larger, del'd New York	43.00
4-in. del'd New York	48.00
4-in. and larger, Birmingham	36.00 to 37.00
4-in. Birmingham	39.00 to 40.00

Class "A" and gas pipe, \$3 extra.

Pig Iron, Ores, Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	\$18.50	\$19.00	\$18.00	\$19.50
Bethlehem, Pa.	18.50	19.00	18.00	19.50
Birdsboro, Pa.	18.50	19.00	18.00	19.50
Swedeland, Pa.	18.50	19.00	18.00	19.50
Sparrows Point, Md.	18.50	19.00	18.00	19.50
Neville Island, Pa.	18.00	18.00	17.00	18.50
Sharpsville, Pa.	17.50	17.50	17.00	18.00
Youngstown	17.50	17.50	17.00	18.00
Buffalo	17.50	18.00	16.50	18.50
Erie, Pa.	17.50	18.00	17.00	18.50
Cleveland	17.50	17.50	17.00	18.00
Toledo, Ohio	17.50	17.50	17.00	18.00
Detroit	17.50	17.50	17.00	18.00
Hamilton, Ohio	17.50	17.50	17.00	18.00
Chicago	17.50	17.50	17.00	18.00
Granite City, Ill.	17.50	18.00	17.00	18.00
Duluth, Minn.	18.00	18.00	17.00	18.00
Birmingham	18.00	18.00	17.00	18.00
Provo, Utah	16.50	16.50	12.50	18.50

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District				
From Everett, Mass.	\$19.00	\$19.50	\$18.50	\$20.00
From Buffalo	19.00	19.50	18.50	20.00
Brooklyn				
From East. Pa. or Buffalo	20.77	21.27	20.27	21.77
Newark or Jersey City, N. J.				
From East. Pa. or Buffalo	19.89	20.39	19.39	20.89
Philadelphia				
From Eastern Pa.	19.26	19.76	18.76	20.26
Cincinnati				
From Hamilton, Ohio	18.51	18.51	18.01	19.01
Canton, Ohio				
From Cleveland and Youngstown	18.76	18.76	18.01	19.01
Columbus, Ohio				
From Hamilton, Ohio	19.50	19.50	18.01	19.01
Mansfield, Ohio				
From Cleveland and Toledo	19.26	19.26	18.01	19.01
Indianapolis				
From Hamilton, Ohio	19.77	19.77	18.01	19.01
South Bend, Ind.				
From Chicago	19.55	19.55	18.01	19.01
Milwaukee				
From Chicago	18.50	18.50	18.01	19.01
St. Paul				
From Duluth	19.44	19.44	18.01	19.01
Davenport, Iowa				
From Chicago	19.26	19.26	18.01	19.01
Kansas City				
From Granite City	20.04	20.54	18.01	19.01

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.	Per Gross Ton
Johnson City, Tenn.	\$23.00
Del'd Chicago	24.65

GRAY FORCE PIG IRON

Valley furnace	\$17.50
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CHARCOAL PIG IRON

Lake Superior furnace	\$20.50
Delivered Chicago	23.54
Delivered Buffalo	23.78

CANADA

Pig Iron

Per gross ton:	Delivered Toronto
No. 1 fdy., sil. 2.25 to 2.75	\$21.00
No. 2 fdy., sil. 1.75 to 2.75	20.50
Malleable	21.00

Per gross ton:	Delivered Montreal
No. 1 fdy., sil. 2.25 to 2.75	\$22.50
No. 2 fdy., sil. 1.75 to 2.75	22.00
Malleable	22.50
Basic	22.00

Ferromanganese

Per Gross Ton	Per Gross Ton
Domestic, 80%, seaboard	\$85.00
Domestic, 80%, seaboard	92.00
(ton lots)	

Spiegeleisen

Per Gross Ton Furnace	Per Gross Ton
Domestic, 19 to 21%	\$26.00

Electric Ferrosilicon

Per Gross Ton Delivered	Per Gross Ton
50% (carloads)	\$77.50
50% (ton lots)	85.00
75% (carloads)	126.00
75% (ton lots)	136.00
14% to 16% (f.o.b.) Welland	31.00
Ont. (in carloads) (duty paid)	31.00
14% to 16% (less carloads)	38.50

Silvery Iron

F.o.b. Jackson, Ohio, Furnace			
Per Gross Ton		Per Gross Ton	
6%	..... \$22.25	12%	..... \$29.25
7%	..... 23.25	13%	..... 30.75
8%	..... 24.25	14%	..... 32.25
9%	..... 25.25	15%	..... 33.75
10%	..... 26.25	16%	..... 35.25
11%	..... 27.75	17%	..... 36.75

Ferrovanadium, del., per lb. contained V.	\$2.70 to \$2.90
Ferrocobalt, 15 to 18% Ti, 6 to 8% C, f.o.b. furnace carload and contract per net ton	\$137.50
Ferrophosphorus, electric, or blast furnace material, in carloads, 18%, Rockdale, Tenn., base, per gross ton with \$2 unitage	50.50
Ferrophosphorus, electric, 24% f.o.b. Anniston, Ala., per gross ton with \$2.75 unitage	65.00
Ferromolybdenum, per lb. Mo., del.	80c.
Calcium molybdate, per lb. Mo., del.	80c.
Silico spiegel, per ton, f.o.b. furnace, car lots	\$38.50
Ton lots or less, per ton	45.50
Silico-manganese, gross ton, delivered:	
2.50% carbon grade	90.00
2% carbon grade	95.00
1% carbon grade	105.00
Spot prices	\$5 a ton higher

Ores

Lake Superior Ores, Delivered Lower Lake Ports	Per Gross Ton
Old range, Bessemer, 51.5% iron	\$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer, 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

Per Unit	Per Unit
Iron, low phos., copper free, 55 to 58% iron, dry Spanish or Algerian	9.50c.
Iron, low phos., Swedish, average 68 1/2% iron	9.50c.
Iron, basic or foundry, Swedish, average, 65% iron	9c.
Iron, basic or foundry, Russian, average, 65% iron	9c.
Manganese, Caucasian, washed 52%	24c.
Manganese, African, Indian, 44-48%	21c.
Manganese, African, Indian, 49-51%	24c.
Manganese, Brazilian, 46 to 48 1/2%	20c.

Per Net Ton Unit	Per Net Ton Unit
Tungsten, Chinese wolframite, duty paid, delivered	\$15.00
Tungsten, domestic scheelite, delivered	\$14.50 to \$15.00

Per Gross Ton	Per Gross Ton
Chrome, 45%, Cr.O., crude, c.i.f. Atlantic Seaboard	\$17.00
Chrome, 48% Cr.O., c.i.f. Atlantic Seaboard	20.00

*Quotations nominal in absence of sales.

Fluorspar

Per Net Ton	Per Net Ton
Domestic, washed gravel, 85-5 f.o.b. Kentucky and Illinois mines for all-rail shipment	\$17.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	18.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	\$17.50 to 18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	19.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2% silicon, f.o.b. Illinois and Kentucky mines	30.00

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:	Per gross ton delivered consumers' yards:
No. 1 heavy melting steel	\$14.00 to \$14.50
No. 2 heavy melting steel	12.50 to 13.00
No. 2 railroad wrought	14.00 to 14.50
Scrap rails	14.00 to 14.50
Rails 3 ft. and under	15.50 to 16.00
Sheet bar crops, ordinary	15.00 to 15.50
Compressed sheet steel	14.00 to 14.50
Hand bundled sheet steel	12.50 to 13.00
Hvy steel axle turnings	13.00 to 13.50
Machine shop turnings	10.50 to 11.00
Short short, steel turnings	10.50 to 11.00
Short mixed borings and turnings	8.50 to 9.00
Cast iron borings	8.50 to 9.00
Cast iron car wheels	13.00 to 13.50
Heavy breakable cast	11.50 to 12.00
No. 1 cast	13.50 to 14.00
Rail, knuckles and couplers	16.00 to 16.50
Roller	16.00 to 16.50
Rail coal and leaf springs	16.00 to 16.50
Rolled steel wheels	16.00 to 16.50
Low phos. billet crops	17.00 to 17.50
Low phos. sheet bar crops	16.50 to 17.00
Low phos. plate scrap	15.50 to 16.00
Low phos. punchings	16.00 to 16.50
Steel car axles	17.00 to 17.50

CHICAGO

Delivered Chicago district consumers:	Per Gross Ton
Heavy melting steel	\$11.50 to \$12.00
Automobile hvy. melt. steel	10.75 to 11.25

Shoveling steel	\$11.50 to \$12.00
Hydraulic comp. sheets	10.50 to 11.00
Drop forge flashings	9.75 to 10.25
No. 1 busheling	10.50 to 11.00
Rolled car wheels	12.50 to 13.00
Railroad tires	12.50 to 13.00
Railroad leaf springs	12.50 to 13.00
Axle turnings	9.50 to 10.00
Steel couplers and knuckles	12.25 to 12.75
Coil springs	12.75 to 13.25
Axle turnings (elec. fur.)	10.50 to 11.00
Low phos. punchings	12.25 to 12.75
Low phos. plates, 12 in. and under	12.75 to 13.25
Cast iron borings	7.25 to 7.75
Short shoveling turnings	7.75 to 8.25
Machine shop turnings	7.00 to 7.50
Rerolling rails	12.50 to 13.00
Steel rails, less than 3 ft.	13.00 to 13.50
Steel rails, less than 2 ft.	12.25 to 12.75
Angle bars, steel	11.75 to 12.25
Cast iron car wheels	12.00 to 12.50
Railroad malleable	12.00 to 12.50
Agricultural malleable	10.00 to 10.50

Per Net Ton	Per Net Ton
Iron car axles	\$12.75 to \$13.25
Steel car axles	12.00 to 12.50
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	10.25 to 10.75

No. 2 busheling	\$4.50 to \$5.00
Locomotive tires, smooth	10.50 to 11.00
Pipe and flues	5.50 to 6.00
No. 1 machinery cast	9.00 to 10.00
Clean automobile cast	9.00 to 9.50
No. 1 railroad cast	9.00 to 9.50
No. 1 agricultural cast	8.00 to 8.50
Store plate	7.50 to 8.00
Grate bars	6.50 to 7.00
Brake shoes	8.50 to 9.00

PHILADELPHIA

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$11.50 to \$12.00
No. 2 heavy melting steel	9.50 to 10.00
No. 1 railroad wrought	11.00
Bundled sheets	9.50
Hydraulic compressed, new	10.00
Hydraulic compressed, old	9.00
Machine shop turnings	7.50
Heavy axle turnings	10.00 to 10.50
Cast borings	5.50 to 6.00
Heavy breakable cast	11.50 to 12.00
Store plate (steel works)	8.50 to 9.00
No. 1 low phos. heavy	15.00 to 15.50
Couplers and knuckles	14.50 to 15.00
Roller steel wheels	14.50 to 15.00
No. 1 blast furnace	5.50 to 6.00
Spec. iron and steel pipe	9.00 to 9.50
Shafting	16.00 to 16.50
Steel axles	14.50
No. 1 forge fire	11.00
Cast iron car wheels	13.00
No. 1 cast	13.00 to 13.50
Cast borings (chem.)	12.00 to 14.00
Steel rails for rolling	13.00

CLEVELAND

Per gross ton delivered consumers' yards:	
No. 1 heavy melting steel	\$12.00 to \$12.50
No. 2 heavy melting steel	11.50 to 12.00
Compressed sheet steel	11.50 to 12.00
Light bundled sheet stampings	8.50 to 9.00
Drop forge flashings	11.50 to 12.00
Machine shop turnings	9.00 to 9.50
Short shoveling turnings	9.00 to 9.50
No. 1 busheling	11.00 to 11.50
Steel axle turnings	10.00 to 10.50
Low phos. billet crops	14.50 to 15.00
Cast iron borings	8.75 to 9.25
Mixed borings and short turnings	9.00 to 9.50
No. 2 busheling	9.00 to 9.50
No. 1 cast	11.00 to 11.50
Railroad grate bars	7.50 to 8.00
Store plate	7.00 to 7.50
Rails under 3 ft.	15.00 to 15.50
Rails for rolling	17.00 to 17.50
Railroad malleable	12.00 to 12.50
Cast iron carwheels	12.25

BUFFALO

Per gross ton, f.a.b. Buffalo consumers' plants:	
No. 1 heavy melting steel	\$12.50
No. 2 heavy melting scrap	11.00
Scrap rails	\$12.25 to 12.75
New hydraulic, comp. sheets	11.00
Old hydraulic, comp. sheets	10.50
Drop forge flashings	11.00
No. 1 busheling	11.00
Hvy. steel axle turnings	10.00 to 10.50
Machine shop turnings	7.00 to 7.50
Knuckles and couplers	14.50 to 15.00
Coil and leaf springs	14.50 to 15.00
Roller steel wheels	14.50 to 15.00
Low phos. billet crops	14.50 to 15.00
Short shov. steel turnings	7.50 to 8.00
Short mixed borings and turnings	7.50 to 8.00
Cast iron borings	7.50 to 8.00
No. 2 busheling	7.50 to 8.00
Steel car axles	13.00 to 13.50
Iron axles	13.00 to 13.50
No. 1 machinery cast	13.00 to 13.50
No. 1 cupola cast	12.00 to 13.00
Store plate	10.25 to 10.75
Steel rails, 3 ft. and under	14.50 to 15.00
Cast iron carwheels	12.50 to 13.00
Industrial malleable	12.50 to 13.00
Railroad malleable	12.50 to 13.00
Chemical borings	10.00 to 11.00

BIRMINGHAM

Per gross ton delivered consumers' yards:	
Heavy melting steel	\$10.00
Scrap steel rails	9.00
Short shoveling turnings	5.50
Store plates	\$7.00 to 7.50
Steel axles	10.50 to 11.00
Iron axles	10.50 to 11.00
No. 1 machinery wrought	7.00
Rails for rolling	10.50
No. 1 cast	9.00 to 9.50
Tramcar wheels	9.00 to 9.50
Cast iron borings, chem.	8.00

ST. LOUIS

Per gross ton delivered consumers' yards:	
Selected heavy steel	\$9.25 to \$9.75
No. 1 heavy melting	9.00 to 9.50
No. 2 heavy melting	8.00 to 8.50
No. 1 locomotive tires	9.50 to 10.00
Misc. stand.-sec. rails	9.25 to 9.75
Railroad springs	11.50 to 12.00
Bundled sheets	6.50 to 7.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 busheling	7.00 to 7.50
Cast iron borings and shoveling turnings	5.25 to 5.75
Rails for rolling	11.00 to 11.50
Machine shop turnings	5.25 to 5.75
Heavy turnings	6.00 to 6.50
Steel car axles	10.50 to 11.00
Iron car axles	13.50 to 14.00
No. 1 railroad wrought	6.00 to 6.50
Steel rails less than 3 ft.	12.50 to 13.00
Steel angle bars	10.00 to 10.50
Cast iron carwheels	8.50 to 9.00
No. 1 machinery cast	9.50 to 10.00
Railroad malleable	9.75 to 10.25
No. 1 railroad cast	9.00 to 9.50
Store plate	6.50 to 7.00
Agricuilt. malleable	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$7.75 to \$8.00
Scrap T rails	7.50 to 7.75
No. 2 steel	6.25 to 6.50
Breakable cast	6.50 to 7.00
Machine shop turnings	3.75 to 4.00
Bundled skeleton, long	3.75 to 6.00
Forge flashings	3.75 to 6.00
Blast furnace scrap	2.75 to 3.00
Shafting	11.00 to 11.50
Steel car axles	10.50 to 11.00
Wrought pipe	5.00 to 5.25
Cast iron borings, chemical	8.00 to 8.50

Per gross ton delivered consumers' yards:	
Textile cast	\$10.00 to \$10.50
No. 1 machinery cast	10.00 to 10.25
Store plate	7.00 to 7.25
Railroad malleable	11.00 to 11.50

NEW YORK

Dealers' buying prices per gross ton:	
No. 1 heavy melting steel	\$8.00 to \$9.50
No. 2 heavy melting steel	7.00 to 8.00
Heavy breakable cast	8.00 to 8.25
No. 1 machinery cast	8.50
No. 2 cast	7.00 to 7.25
Store plate	7.50
Steel car axles	10.75 to 11.50
No. 1 railroad wrought	7.50 to 8.00
No. 1 yard wrought, long	6.50 to 7.00
Spec. iron and steel pipe	5.75 to 6.00

Forge fire	\$5.50 to \$6.00
Rails for rolling	9.50 to 10.00
Short shoveling turnings	3.00 to 4.00
Machine shop turnings	3.50 to 4.00
Cast borings	4.50 to 4.75
No. 1 blast furnace	2.50 to 4.00
Cast borings (chemical)	11.00 to 11.50
Unprepared yard iron and steel	5.00 to 5.50
Per gross ton, delivered local foundries:	
No. 1 machinery cast	\$12.00
No. 1 hvy. cast (cupola size)	10.50
No. 2 cast	9.00

CINCINNATI

Dealers' buying prices per gross ton:	
Heavy melting steel	\$8.75 to \$9.50
Scrap rails for melting	9.50 to 10.00
Loose sheet clippings	5.25 to 5.75
Bundled sheets	6.50 to 7.00
Cast iron borings	6.50 to 7.00
Machine shop turnings	6.00 to 6.50
No. 1 busheling	7.00 to 7.50
No. 2 busheling	4.00 to 4.50
Rails for rolling	10.00 to 10.50
No. 1 locomotive tires	9.50 to 10.00
Short rails	12.25 to 12.75
Cast iron carwheels	8.75 to 9.25
No. 1 machinery cast	10.00 to 10.50
No. 1 railroad cast	9.50 to 10.00
Burnt cast	7.00 to 7.50
Store plate	7.00 to 7.50
Agricultural malleable	9.00 to 9.50
Railroad malleable	9.00 to 9.50

DETROIT

Dealers' buying prices per gross ton:	
Heavy melting steel	\$9.50 to \$10.00
Borings and short turnings	7.25 to 7.75
Long turnings	9.50 to 10.00
No. 1 machinery cast	11.00 to 11.50
Automotive cast	12.00 to 12.50
Hydraulic comp. sheets	9.75 to 10.25
Store plate	8.00 to 8.50
New factory busheling	8.50 to 9.00
Old No. 2 busheling	5.75 to 6.25
Sheet clippings	8.00 to 8.50
Flashings	8.00 to 8.50
Low phos. plate scrap	9.75 to 10.25

CANADA

Dealers' buying prices per gross ton:	
	Toronto Montreal
Heavy melting steel	\$5.50 \$5.50
Rails, scrap	6.00 4.50
Machine shop turnings	2.50 2.50
Boiler plate	4.50 4.50
Heavy axle turnings	2.50 2.50
Cast borings	3.00 3.00
Steel borings	2.00 2.00
Wrought pipe	2.50 2.50
Steel axles	4.50 6.00
Axles, wrought iron	4.50 6.50
No. 1 machinery cast	7.75 9.00
Store plate	4.50 5.00
Standard carwheels	7.25 7.50
Malleable	6.75 7.00

Warehouse Prices for Steel Products

PITTSBURGH

Base per Lb.	
Plates	3.05c.
Structural shapes	3.05c.
Soft steel bars and small shapes	2.85c.
Reinforcing steel bars	3.00c.
Cold-finished and screw stock	
Rounds and hexagons	3.45c.
Squares and flats	3.45c.
Hoops and bands, under 1/4 in.	3.10c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.15c.
Galv. sheets (No. 24), 25 or more bundles	3.70c.
Hot-rolled sheets (No. 10)	2.85c.
Galv. corrug. sheets (No. 24), per square (more than 3750 lb.)	\$3.32
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count.	65 per cent off list.
Machine bolts, 100 count.	65 per cent off list.
Carriage bolts, 100 count.	65 per cent off list.
Nuts, all styles, 100 count.	65 per cent off list.
Large rivets, base per 100 lb.	\$3.25
Wire, black, soft ann'l'd, base per 100 lb.	\$2.575c.
Wire, galv. soft, base per 100 lb.	\$2.575c.
Common wire nails, per keg	\$2.575c.
Cement coated nails, per keg	\$2.575c.

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 9999 lb.
*Delivered in Pittsburgh switching district.

CHICAGO

Base per Lb.	
Plate and structural shapes	3.10c.
Soft steel bars	2.90c.
Cold-fn. steel bars and shafting	
Rounds and hexagons	3.40c.
Flats and squares	3.40c.
Bands, 3/16 in. (in Nos. 10 and 12 gages)	3.20c.
Hoops (No. 14 gage and lighter)	3.20c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.30c.
Hot-rolled sheets (No. 10)	2.85c.
Spikes (9/16 in. and lighter)	3.50c.
Track bolts	4.65c.
Rivets, structural (keg lots)	3c.
Rivets, boiler (keg lots)	3.10c.
Per Cent Off List	
Machine bolts	60 and 5
Carriage bolts	60 and 5
Coach and lag screws	60 and 5
Hot-pressed nuts, sq. tap, or blank	60 and 5
Hot-pressed nuts, hex. tap or blank	60 and 5
Hex. head and cap screws	80
Cup point set screws	70
Flat head bright wood screws	37 1/2 and 10
Spring cotter pins	50
Store bolts in full packages	72 1/2
Rd. hd. tank rivets, 7/16 in. and smaller	65
Wrought washers	\$5.50 off list
No. 8 black ann'l'd wire per 100 lb.	\$3.75
Com. wire nails, base per keg	2.70c.
Cement c'd nails, base per keg	2.70c.

NEW YORK

Base per Lb.	
Plates	3.30c.
Structural shapes	3.27c.
Soft steel bars	3.17c.
Iron bars	3.24c.
Iron bars, swed. charcoal	6.50 to 7.25c.
Cold-fn. shafting and screw stock	
Rounds and hexagons	3.92c.
Flats and squares	4.42c.
Cold-fn. strip, soft and quarter hard	4.00c.
Hoops	3.42c.
Bands	3.42c.
Hot-rolled sheets (No. 10)	3.17c.
Hot-rolled ann'l'd sheets (No. 24)	3.65c.
Galvanized sheets (No. 24)	4.20c.
Long term sheets (No. 24)	5.00c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.30c.
Wire, galv. (No. 10)	3.80c.

Tire steel, 1 x 1/4 in. and larger	3.50c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	\$3.00
Machine bolts, cut thread:	Per Cent Off List
Up to 1 in. dia. inclusive	80
Over 1 in. dia.	50
Carriage bolts, cut thread:	
Up to 1/2 in. dia. inclusive	60
Over 1/2 in. dia.	50
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	\$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

Base per Lb.	
Plates and struc. shapes	3.34c.
Bars, soft steel or iron	3.14c.
Cold-fn. rounds, shafting, screw stock	3.74c.
Hot-rolled annealed sheets (No. 24)	3.45c.
Galv. sheets (No. 24)	4.54c.
Hot-rolled sheets (No. 10)	3.19c.
Galv. corrug. sheets (No. 24)	3.99c.
*Galv. corrug. sheets	4.59c.
Structural rivets	3.59c.
Boiler rivets	3.84c.
Per Cent Off List	
Tank rivets, 7/16 in. and smaller	60
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts	
1000 lb. or over	60
200 to 999 lb.	55 and 5
100 to 199 lb.	50 and 5
Less than 100 lb.	50
*No. 26 and lighter take special prices.	

PHILADELPHIA

Base per Lb.	
*Plates, 1/4-in. and heavier	2.75c.
*Structural shapes	2.75c.
*Soft steel bars, small shapes, iron bars (except bands)	2.75c.
*Reinforc. steel bars, sq. twisted and deformed	2.505c.
Cold-finished steel bars	3.73c.
*Steel hoops	3.30c.
*Steel bands, No. 12 to 3/16 in. incl.	3.05c.
Spring steel	5.00c.
*Hot-rolled annealed sheets (No. 24)	3.40c.
*Galvanized sheets (No. 24)	4.00c.
*Hot-rolled annealed sheets (No. 10)	2.95c.
Diam. pat. floor plates, 1/4 in.	4.75c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.
*Base prices subject to deduction on orders aggregating 4000 lb. or over.
†For 50 bundles or over.
‡For 5 tons or more, exclusive of cutting charge.

CLEVELAND

Base per Lb.	
Plates and struc. shapes	3.21c.
Soft steel bars	2.90c.
Reinforc. steel bars	2.00c. to 2.50c.
Cold-finished steel bars	3.40c.
Flat rolled steel under 1/4 in.	3.20c.
Cold-finished strip	5.55c.
Hot-rolled annealed sheets (No. 24)	3.76c.
Galvanized sheets (No. 24)	4.36c.
Hot-rolled sheets (No. 10)	3.01c.
Black ann'l'd wire, per 100 lb.	\$2.45
No. 9 galv. wire, per 100 lb.	2.80
Com. wire nails, base per keg	2.45

CINCINNATI

Base per Lb.	
Plates and struc. shapes	3.30c.
Bars, soft steel or iron	3.10c.
New billet reinfrc. bars	3.10c.
Rail steel reinfrc. bars	3.10c.

BUFFALO

Base per Lb.	
Plates	3.37c.
Struc. shapes	3.15c.
Soft steel bars	2.95c.
Reinforcing bars	1.95c.
Cold-fn. flats and sq.	3.55c.
Round and hex.	3.55c.
Cold-rolled strip steel	3.55c.
Hot-rolled annealed sheets (No. 24)	3.65c.
Heavy hot-rolled sheets, 3/16 in.	
24 to 48 in. wide	3.42c.
Galv. sheets (No. 24)	4.25c.
Bands	3.32c.
Hoops	3.32c.
Hot-rolled unannealed sheets	3.07c.
Com. wire nails, base per keg	4.00c.
Black wire, base per 100 lb.	3.35

BOSTON

Per Lb.	
Beams, channels, angles, tees, zees	3.42c.
H beams and shapes	3.42c.
Plates—sheared, tank and univ. mill, 1/4 in. thick and heavier	3.42c.
Floor plates, diamond pattern	5.12c

PERSONALS

JOSEPH C. ECKEL has been appointed assistant manager of sales of the American Sheet & Tin Plate Co., with headquarters at Pittsburgh. His early business career was with the Pennsylvania Railroad, after which he entered the employ of the American Sheet & Tin Plate Co. in 1909, start-



JOSEPH C. ECKEL

ing in the order department and later serving in the inspection and metallurgical departments. For the past several years, he has been engaged in sales promotional work and special engineering duties. Mr. Eckel received his formal education at the Pittsburgh Academy and the Carnegie Institute of Technology. He is a member of the American Society for Testing Materials and American Ceramic Society.

♦ ♦ ♦

BATT L. SPAIN, for the past 24 years manager of turbo-blower sales at the West Lynn, Mass., works of the General Electric Co., has been made manager of the turbo-blower department of the Ingersoll-Rand Co., New York. The occasion for the transfer is the recent acquisition of the turbo-blower business of General Electric by the Ingersoll-Rand Co.

♦ ♦ ♦

COL. HARRY SCULLIN, president of the Scullin Steel Co., St. Louis, has been appointed Excise Commissioner of that city.

♦ ♦ ♦

B. H. NEWELL has been named general superintendent of the gray iron foundry of the Buick Motor Co., Flint, Mich. He has long been identified with the automobile industry, in its early days having been for 10 years superintendent of the foundry of Dodge Brothers Corp. Later he

Edward N. Gosselin continues as President of the Graver Tank & Mfg. Corp. and Phoenix Manufacturing Co. A previous statement that appeared in this column was erroneous.

served for three years as foundry superintendent for the Oakland Motor Car Co. During the last 15 months he has been assistant to the

foundry manager of the Cadillac Motor Car Co. Mr. Newell is a graduate of Ohio State University.

♦ ♦ ♦

ALBERT J. LINDEMANN, one of the founders and president of the A. J. Lindemann & Hoverson Co., Milwaukee, pioneer stove and range manufacturer, was guest of honor at the luncheon of the Rotary Club of Milwaukee on March 27 on the occasion of his eightieth birthday anniversary. He is a charter member of the Rotary Club and has been active in its affairs for 20 years.

What steel shall I order that will combine machinability and cold deforming ...

Just check the new WYCKOFF Steel Wall Chart . . . gives complete tables of the various kinds of cold drawn steels arranged to help you select the proper grade of steel for any given purpose . . . lists the most commonly used grades of steel according to their adaptability for specific purposes . . . contains detailed conversion tables . . . shows the exact weight per lineal foot of all standard sized bars to the fourth decimal.

It also contains SAE Specifications on Automotive Steels and reveals the wide scope of service you have available with the WYCKOFF organization.

If you have not already received your copy, write us today.

WYCKOFF DRAWN STEEL COMPANY

GENERAL OFFICES: Ambridge, Pa.
MILLS at Ambridge, Pa. and Chicago, Ill.

Manufacturers of
COLD DRAWN STEELS
Turned and Polished Shafting, Turned and Ground Shafting



Steel Output Rises to 40 Per Cent at Philadelphia



Railroad Demand Well Sustained—Second Quarter Contracting Still Active—Pig Iron Prices Advanced \$1 a Ton

PHILADELPHIA, April 10.—With releases from the railroads gradually expanding and miscellaneous demand slightly heavier, steel ingot production in this district has risen four points to 40 per cent of capacity, the highest level of the year. The leading interest is engaged at a considerably better rate and one or two of the smaller independent companies have increased their schedules. Finishing mill output is stronger in the case of rails, track supplies, plates and some forms of sheets.

The entering of contracts for the remainder of the second quarter at prevailing quotations is still occupying the major attention of steel producers, and with the new prices not effective until next week, it is likely that coverage will be very complete. Under the circumstances it is not to be expected that any shipments during the remainder of the quarter will take the new prices except structural steel, reinforcing bars and other construction products destined for identified structures or the Government.

Railroad orders still constitute the bulk of current releases, although

miscellaneous demand is reported to be a little heavier. Mills are anxious to distribute tonnage now being contracted for over as wide a period as possible in order to avoid a rush of business in June. This is being done in most cases.

Pig iron prices in this district have been advanced \$1 a ton, effective early next week. Scrap remains very dull.

Pig Iron

Producers in this territory have filed prices \$1 a ton above recent levels, and effective April 16, foundry iron will be quotable at \$19.50, basic at \$19, malleable at \$20 and Bessemer at \$20.50, f.o.b. eastern Pennsylvania furnace. Small buyers generally have rushed to cover themselves for the remainder of the quarter at current levels and sellers have booked heavy tonnages in the last week. No sizable transactions have been reported in the open market, but two large pipe foundries as well as a non-integrated steel company in the territory are reported to have bought large tonnages from a New York State producer. Foreign iron is still a factor in this

district, but its use by pipe foundries is limited by the requirements of PWA contracts.

Bars, Plates and Shapes

The Marcus Contracting Co., New York, was low bidder on the Camden, N. J., section of the high-speed approach to the Philadelphia-Camden bridge, which will take 2350 tons of structural steel and a considerable tonnage of sheet steel piling and reinforcing bars. The Jones & Laughlin Steel Corp. has taken 1100 tons of piling for breakwaters at Cape May, N. J. Otherwise sizable construction jobs have been lacking, although fabricators report an increase in small miscellaneous projects. Merchant bars continue rather quiet and road work is the chief outlet for reinforcing steel. Specifications for plates from the railroads are steadily improving as car building and repair programs get under way. The Seaboard Airline is soon to buy 1000 freight cars and the Delaware, Lackawanna & Western has placed 500 cars.

Sheets

Second quarter contracting for sheet steel has been heavy, but is reported to be largely completed in this territory. Mills foresee little difficulty in filling orders placed thus far, but are anxious to distribute the tonnage throughout the quarter as much as possible. Radio makers are somewhat busier and the automobile body plants in the vicinity are taking shipments steadily. Jobber demand continues rather quiet.

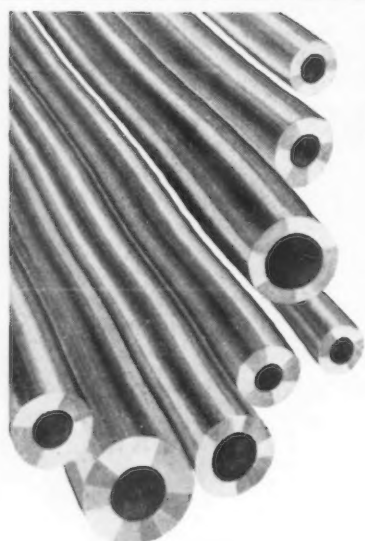
Imports

The following iron and steel imports were received here last week: 6609 tons of pig iron from The Netherlands and 100 tons from British India; steel bands, 10 tons from Belgium, 89 tons from France and 7 tons from Germany; steel bars, 136 tons from France, 20 tons from Germany and 15 tons from Belgium; structural shapes, 205 tons from France and 32 tons from Belgium. Chrome ore imported from Cuba amounted to 2202 tons.

Scrap

The scrap market remains very dull. In spite of the fact that recent advances in pig iron prices have brought them to a level more than twice the current quotations on some grades of scrap, neither foundries nor non-integrated steel companies are showing much interest in scrap purchases. The cast grades remain strong, but stove plate has declined 50c. a ton.

The New York office of the Charles Dreifus Co., Pittsburgh dealer in iron and steel scrap, has been moved to the Salmon Tower Building, 11 West Forty-second Street.



TOOL STEEL TUBING

**NON-SHRINK
OIL HARDENING
NON-DEFORMING**

**for RING DIES
CUTTING DIES
SPACERS, BUSHINGS, Etc.**

Manufacturers of BISCO Tungsten Carbide
drawing dies for wire, rod and tubing.

THE BISSETT STEEL CO., INC.

945 E. 67th ST.

Cincinnati

Worcester

CLEVELAND, OHIO

Buffalo

Cotton Textile Industry To Spend \$100,000,000

BASED upon the removal of legislative obstacles, the cotton textile industry is prepared to make a potential outlay of \$100,000,000 for capital goods equipment during the next 18 months. Announcement to this effect was made here today by George A. Sloan, chairman of the cotton textile code authority and of the consumers goods industries committee. This outlay is indicated in a survey just completed by the authority.

Obstacles which must first be removed include such measures as the Wagner and Connery labor bills and the securities bill. The expenditure, said the statement, is conditioned on assurance to industry of the same constructive cooperation from the legislative branch of the Government as has characterized its relations with the NRA.

Additional Price Advances

	Present Price per Lb.	New Price per Lb.	Ad- vance per Ton
Alloy steel bars.....	2.45c.	2.50c.	\$1
No. 20 vitreous enamel sheets.....	3.30c.	3.60c.	6
No. 10 vitreous enamel sheets.....	2.45c.	2.60c.	3
No. 10 cold-finished mill run sheets.....	2.20c.	2.45c.	5
No. 24 long ternes....	3.25c.	3.45c.	8
No. 20 fender stock....	3.10c.	3.50c.	8
No. 16 gage fender stock.....	2.95c.	3.20c.	5
Floor plates.....	3.20c.	3.35c.	3
Sheet steel piling.....	2.00c.	2.15c.	3
	100 Lb.	100 Lb.	
Large rivets.....	\$2.75	\$3.00	5
	Gross Ton	Gross Ton	
Light rails.....	\$32.00	\$35.00	3
	Box	Box	
Stock tin plate.....	\$4.55	\$4.90	7

These prices are f.o.b. Pittsburgh. Prices at other basing points are in the usual relationship to Pittsburgh.

March U. S. Steel Shipments Made Big Gain

FINISHED steel shipments of the United States Steel Corp. for March totaled 588,209 tons. This is

MONTHLY SHIPMENTS OF STEEL PRODUCTS BY UNITED STATES STEEL CORPN.

Month	1933				1934			
	Ship- ments	Per Cent of Capacity	Ship- ments	Per Cent of Capacity	Ship- ments	Per Cent of Capacity	Ship- ments	Per Cent of Capacity
January.....	1,104,168	800,031	426,271	285,138	17.7	331,777	19.8	
February.....	1,141,912	762,522	413,001	275,929	18.5	385,500	26.3	
March.....	1,240,171	907,251	388,579	256,793	15.3	588,209	36.6	
April.....	1,188,456	878,558	395,091	335,321	21.6	.....	.....
May.....	1,203,916	764,178	338,202	455,302	27.1	.....	.....
June.....	984,739	653,104	324,746	603,937	37.4	.....	.....
July.....	946,745	593,900	272,448	701,322	45.1	.....	.....
August.....	947,402	573,372	291,688	668,155	39.8	.....	.....
September.....	867,282	486,928	316,019	575,161	35.6	.....	.....
October.....	784,648	476,032	310,007	572,897	35.5	.....	.....
November.....	676,016	435,697	275,594	430,358	26.7	.....	.....
December.....	579,098	351,211	227,576	600,639	38.7	.....	.....
Plus yearly adjust- ment.....	(40,259)	(6,040)	(5,160)	(44,283)	.....	.....	.....	.....
Total for year..	11,624,294	7,676,744	3,974,062	5,805,235	30.1	.....	.....	.....

the largest monthly total since last December, and the largest March volume since 1931.

Corporation shipments for the first quarter of this year aggregated 1,305,486 tons, as compared to 817,860 tons in the first quarter of 1933.

Cast Iron Pipe

City of New York through CWA purchasing department has awarded about 400 tons of pipe and fittings to United States Pipe & Foundry Co., Donaldson Iron Co., and R. D. Wood & Co. Latter company received only a small portion of the tonnage.

Almond, N. Y., plans water pipe line system. Fund of \$37,000 has been secured through Federal aid for this and waterworks station. W. S. Lozier, 10 Gibbs Street, Rochester, N. Y., is engineer.

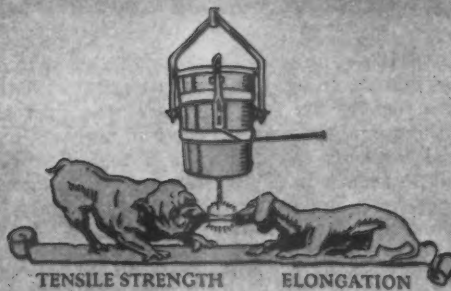
Sanitary District No. 2, Henrico County, near Sandston, Va., care of R. Stuart Royer, Builders' Exchange Building, Richmond, Va., consulting engineer, has secured Federal loan for \$73,000 for water pipe line system.

Summerton, S. C., plans water pipe line system. Fund of \$37,000 has been secured through Federal aid, including waterworks station.

Pewamo, Mich., plans water pipe line extensions. Cost about \$20,000.

Eagle River, Wis., plans water pipe line system, with pumping station. W. G. Kirchoffer, 22 North Carroll Street, Madison, Wis., is consulting engineer.

STRONG STEEL CASTINGS



Strong Steel Foundry Co.

Buffalo, New York

Cincinnati has opened bids on 76,000 ft., 3 to 12-in.; United States Pipe & Foundry Co. is low bidder.

Georgetown, Ill., placed 800 tons with McWane Cast Iron Pipe Co.

Savanna, Ill., will take bids soon for pipe line extensions and other water system improvements. Cost about \$72,000. Consoer, Townsend, Older & Quinlan, 205 West Wacker Drive, Chicago, consulting engineers.

O'Neil Construction Co., 114 Fourth Avenue, Leavenworth, Kan., has been awarded contract for water pipe line system at Fort Leavenworth, at \$52,500.

Wayne, Okla., plans water pipe line system. Fund of \$32,000 is being arranged, including waterworks station.

Gilroy, Cal., plans trunk water pipe line from reservoir on Hecker Pass Road to city. Special election will be held May 7 to approve bonds. Cost \$37,000.

Miscellaneous Price Changes

NEW lowest base prices filed with the American Iron and Steel Institute follow:

Product Classification	Base Price per Lb.	F.o.b. Basing Point
High-speed hack saw sheet steel (effective April 15).....	\$0.50	Pittsburgh
Per Cent		
Tungsten.....	18	
Chrome.....	4	
Vanadium.....	1	
Tungsten hack saw sheet steel (April 15).....	0.1575	Pittsburgh
Per Cent		
Tungsten.....	1.35	
High-molybdenum hack saw sheet steel (effective April 15).....	0.28	Pittsburgh
Per Cent		
Cr approx. 4		
Va approx. 1		
W approx. 1½		
Mo approx. 7½		
Base Price Per 100 Lb.		
Core wire (April 15)...	\$4.20	Anderson
Galvanized armor wire (April 15).....	3.55	Anderson
High-carbon basic wire (equivalent to M. B.) (April 15).....	4.10	Anderson
Tube rounds (April 17).....	2.00	Buffalo

Consumer Purchases Increase as All Metals Quotations Sharply Advance

Lead Steadies at 4.25c., New York—Spelter Sales Total 9500 Tons—Tin Rises to 55.80c.—Good Copper Demand at 8.50c.

NEW YORK, April 10.—The electrolytic copper market is again active at a price above 8c. for the first time since the monetary program last fall forced the bids to 9c. Metal is now difficult to secure in the open market under 8.50c. a lb., Connecticut Valley, although a few parcels changed hands this morning at 8.37½c. Naturally the consumptive outlook of copper has not materially changed within the past week, but the virtual completion of code negotiations has sharply altered the whole market position. Although the code provides for a freezing of the enormous stock surplus, current production is adequate to satisfy present requirements. It is only natural that producers should seek a higher return for their copper, but the market is still not in a position to firmly support metal much above an 8.50c. basis. The situation here is being helped considerably by the active demands

from abroad at c.i.f. prices practically on a parity with the 8.50c. level here. This is the first time this year that the two markets have been quoted the same, and European consumers are taking advantage of the position to stock metal as a protection against further price advances.

Tin

Although London prices advanced over £3 during the week, a stronger dollar position abroad has reduced the effect on prices here. Straits and English brands are now available in New York at 55.80c. a lb., and sales throughout the week were comparatively large with dealers and consumers sharing almost equally in the activity. The statistical position abroad is bound to get steadily tighter, which will probably be reflected in higher prices here, and this outlook is, therefore, encouraging professional interest in this market. The

English prices this morning on first call were £240 10s. and £239 5s. for spot and future standard respectively, and £244 for Straits in the Far Eastern market.

Lead

Buying was somewhat stimulated by yesterday's \$2 a ton advance, and consumers again entered the market today for sizable April-May tonnages as the market increased another 15 points to 4.25c. a lb., delivered, New York. Sales for the current month exceed 26,000 tons, and over 10,000 tons for May delivery is already on producer's books. It is judged that actual consumptive requirements are improving, but the price advance was more of a sympathetic rise with other non-ferrous metals than an improvement of the supply-demand ratio. The long prevailing price of 4c. was somewhat disadvantageous for producers, but the negative statistical trend precluded any price buoyancy. As the statistical position will not show marked improvement for several months, it is doubtful that the present price will continue to increase.

Zinc

The steady position of ore prices and the sudden rise of the copper market served to support the additional \$1 a ton advance which leading zinc smelters put into effect on Monday morning. Spelter is now priced at 10 points above the position a week earlier, and the rising market attracted considerable tonnage to sellers' books. Over 9500 tons was sold last week at prices ranging from 4.25c. to 4.35c., as compared with 1500 tons in the preceding period, and 2000 tons booked two weeks ago. Current business volume represents tonnages which were delayed several weeks ago as the market weakened, but actual zinc requirements are as yet not sufficient to support much higher quotations. Leading Tri-State ore producers are holding their price at \$28 a ton, although \$30 has been paid in several directions. Despite general reductions in output Joplin production of 6000 tons in the week just closed exceeded sales by 1500 tons. Total reserve bin stocks now amount to 15,300 tons, which is about a 6000-ton increase over the stocks of Jan. 1. Production of zinc in March totaled 33,721 tons, against 37,270 tons produced in February, whereas March shipments of 32,753 tons were only 392 tons greater than shipments in February.

Gate City Iron Works, Omaha, Neb., has been appointed distributor of Toncan copper molybdenum iron, by Republic Steel Corp., Youngstown. Complete warehouse stock of Toncan iron sheets will be carried.

Oliver Brothers, Inc., resident buyers, 200 Hudson Street, New York, will open branch in Chicago, on April 23, in Buckingham Building, 59 East Van Buren Street. Chicago office will be under the direction of Wilson Oliver, for the past 10 years in charge of the Pittsburgh office.

The Week's Prices. Cents Per Pound for Early Delivery

	April 4	April 5	April 6	April 7	April 9	April 10
Electrolytic copper, N. Y.*	7.75	8.00	8.00	8.00	8.12½	8.25
Lake copper, N. Y.	8.00	8.25	8.25	8.25	8.37½	8.50
Straits tin, Spot, N. Y.	55.20	55.85	56.70		56.25	55.80
Zinc, East St. Louis	4.30	4.30	4.35	4.35	4.40	4.40
Zinc, New York	4.65	4.65	4.70	4.70	4.75	4.75
Lead, St. Louis	3.90	3.90	3.90	3.90	3.95	4.15
Lead, New York	4.00	4.00	4.00	4.00	4.10	4.25

*Refinery quotations; price ¼c. higher delivered in Connecticut.
Aluminum, 98-99 per cent, 22.90c. a lb. delivered.
Aluminum, remelt No. 12 (alloy), carload lots delivered, 16c. a lb., average for week.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 7.95c. a lb., New York.
Brass ingots, 85-5-5-5, 8.50c. a lb., New York and Philadelphia.

From New York Warehouse	
Delivered Prices, Base per Lb.	
Tin, Straits pig	57.00c. to 58.00c.
Tin, bar	59.00c. to 60.00c.
Copper, Lake	9.75c. to 10.50c.
Copper, electrolytic	9.50c. to 10.00c.
Copper, castings	9.25c. to 10.25c.
*Copper sheets, hot-rolled	15.00c.
*High brass sheets	13.75c.
*Seamless brass tubes	12.25c.
*Seamless copper tubes	12.25c.
*Brass rods	12.25c.
Zinc slabs	5.75c. to 6.75c.
Zinc sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	5.00c. to 6.00c.
Lead, bar	6.00c. to 7.00c.
Lead, sheets	8.00c.
Antimony, Asiatic	9.25c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.00c. to 19.00c.
Solder, ½ and ⅓	33.00c. to 34.00c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse	
Delivered Prices per Lb.	
Tin, Straits pig	59.75c.
Tin, bar	61.75c.

Copper, Lake	9.00c.
Copper, electrolytic	9.00c.
Copper, castings	8.75c.
Zinc, slab	5.75c. to 6.00c.
Lead, American pig	5.10c. to 5.35c.
Lead, bar	8.00c.
Antimony, Asiatic	9.00c.
Babbitt metal, medium grade	19.50c.
Babbitt metal, high grade	64.00c.
Solder, ½ and ⅓	36.00c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	6.75c.	7.50c.
Copper, hvy. and wire	6.50c.	7.25c.
Copper, light and bottoms	5.50c.	6.50c.
Brass, heavy	3.62½c.	4.37½c.
Brass, light	3.12½c.	3.75c.
Hvy. machine composition	5.00c.	5.87½c.
No. 1 yel. brass turnings	4.37½c.	5.25c.
No. 1 red brass or compos. turnings	4.37½c.	5.37½c.
Lead, heavy	3.00c.	3.625c.
Zinc	2.50c.	3.125c.
Cast aluminum	9.50c.	11.25c.
Sheet aluminum	12.25c.	13.50c.

HY-TEN S.A.E. STEELS

1315X, 1045, 2315, 4615, 3140, 5150, 6145, 4150

are available for immediate stock shipment

WHEELOCK, LOVEJOY & COMPANY, INC.

CAMBRIDGE

CHICAGO

CLEVELAND

DETROIT

Fabricated Structural Steel

Awards Higher—New Projects Decline

ALTHOUGH the bulk of lettings was in small tonnages, awards totaled 12,160 tons, compared with 8150 tons last week. The only sizable bookings were 1360 tons for an extension to the plant of the Wheeling Steel Corp. at Yorkville, Ohio, and 1200 tons for a toll bridge at Oklachnee Bay, Fla. New projects of 13,700 tons compare with 18,300 tons in the previous week and 10,400 tons two weeks ago. Large new jobs are 5000 tons for a chemical plant at Baton Rouge, La., for the Solvay Process Corp. and 3000 tons for a bridge at Buzzards Bay, Mass. Plate awards call for 1350 tons. Structural steel awards for the week follow:

NORTH ATLANTIC STATES

Boston & Albany Railroad, 500 tons, bridge at West Newton, Mass., to Phoenix Bridge Co.

Mattapan, Mass., 100 tons, State hospital unit to Boston Structural Steel Co., Inc.

New York, 340 tons, steel curbing for mid-town tunnel, to McClintic-Marshall Corp.

New York, 670 tons, Sheffield Farms Co., Inc., 125th Street building, to F. G. Schaefer Iron Works.

Schenectady, N. Y., 300 tons, County home, to Franken-Fordyce Co.

Buffalo, 100 tons, addition to South Park high school, to Ernst Iron Works.

Niagara Falls, N. Y., 150 tons, laboratory building for Union Carbide Co., to McClintic-Marshall Corp.

Central Railroad of New Jersey, 135 tons, bridge at Jersey City, N. J., to McClintic-Marshall Corp.

Jenkintown, Pa., 135 tons, W. C. Fleck Co. building, to Frank M. Weaver & Co., Inc.

Greene County, Pa., 405 tons, highway bridge, to Jones & Laughlin Steel Corp.

Cape May, N. J., 1100 tons, sheet steel piling, breakwater, to Jones & Laughlin Steel Corp.

Atlantic City, N. J., 300 tons, passenger station for Pennsylvania and Reading railroads, to McClintic-Marshall Corp.

Philadelphia, 160 tons, paper storage building for Container Corp. of America, to Frank M. Weaver, Lansdale, Pa.

Aberdeen, Md., 370 tons, warehouse, to Dietrich Brothers.

Williamsport, Md., 170 tons, reconstruction of Washington-Berkeley Bridge Co.'s toll bridge, to American Bridge Co.

SOUTH AND SOUTHWEST

Fort Benning, Ga., 200 tons, apartment buildings, to Dietrich Brothers.

Oklachnee Bay, Fla., 1200 tons, toll bridge for Continental Bridge Co., to McClintic-Marshall Corp.

Williamson County, Tex., 170 tons, bridge, to Kansas City Structural Steel Co.

Hominy, Okla., 150 tons, bridge, to Capitol Steel & Iron Co., Oklahoma City.

CENTRAL STATES

Yorkville, Ohio, 1360 tons, mill buildings for Wheeling Steel Corp., to Fort Pitt Bridge Works Co.

Chicago, Burlington & Quincy Railroad, 200 tons, bridge at Naperville, Ill., to McClintic-Marshall Corp.

State of Illinois, 100 tons, bridge, to Clinton Bridge Co.

Glenarm, Ill., 150 tons, bridge, to McClintic-Marshall Corp.

Bond County, Ill., 460 tons, bridge, to American Bridge Co.

Chicago, 480 tons, International Harvester Co. coke pocket, to Wisconsin Bridge & Iron Co.

East Chicago, Ind., 600 tons, piling, dock for Wadham Oil Co., to Inland Steel Co.

Cedar Rapids, Iowa, 175 tons, warehouse, to Iowa Steel & Iron Works.

State of Iowa, 680 tons, highway bridges, to Des Moines Steel Co.

La. Crescent, Minn., 255 tons, bridge, to American Bridge Co.

Minneapolis, 370 tons, University of Minnesota Sports Building, to Crown Iron Works.

Salina, Kan., 190 tons, State highway bridge, to Capital Iron Works Co., Topeka.

WESTERN STATES

Pueblo, Colo., 130 tons, State highway bridge, to American Bridge Co.

State of Colorado, 415 tons, State bridges in two counties, to unnamed bidders.

State of Montana, 150 tons, bridge and bridge repairs, to Minneapolis-Moline Power Implement Co.

Evanston, Wyo., 130 tons, highway bridge, to American Bridge Co.

Northern Pacific Railroad, 135 tons, to Minneapolis-Moline Power Implement Co.

State of California, 115 tons, State highway work in four counties, to unnamed bidders.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Somerville-Medford, Mass., 900 tons, State bridge.

Buzzards Bay, Mass., 3000 tons, railroad bridge; contracts to be let by United States War Department.

Newark, N. Y., 1200 tons, State school.

Lycoming County, Pa., 260 tons, highway bridge.

Baton Rouge, La., 5000 tons, chemical plant for Solvay Process Corp.

Oklahoma City, 375 tons, bridge.

CENTRAL STATES

Detroit, 450 tons, furnace gas cleaning system for Ford Motor Co.

Detroit, 500 tons, coal handling plant.

State of Illinois, 2300 tons, bridges; American Bridge Co. low bidder.

State of Illinois, 3285 tons, highway bridges; Spring Valley, 1400 tons; Sunset, 190 tons; Riverdale, 190 tons; Dixmore, 275 tons; Roselle, 230 tons.

WESTERN STATES

Bannock County, Idaho, 615 tons, State subway; bids April 13.

Port Townsend, Wash., 200 tons, building, wharf and basin at United States Quarantine Station; bids April 20.

Juneau, Alaska, 1200 tons, bridge across Gastineau Channel for Alaska Road Commission, bids under advisement.

FABRICATED PLATE

AWARDS

New York, 120 tons, welded tank to be built by United Dry Docks, Inc., to Lukens Steel Co.

New York, 455 tons, locks and shields for midtown tunnel, to Alco Products Co.

Jersey City, N. J., 150 tons, bridge deck plate, to Phoenix Bridge Co.

Jamaica, N. Y., 190 tons, standpipe, to Chicago Bridge & Iron Works.

Gretna, La., 110 tons, 250,000-gal. tank, to Pittsburgh-Des Moines Steel Co.

Milwaukee, 150 tons, main air header for sewage disposal plant extension, to Cream City Boiler Co., Milwaukee.

Kansas City, Kan., 160 tons, welded pipe for United States Engineers, to Black, Sivals & Bryson, Inc.

NEW PROJECTS

Appleton, Wis., unstated tonnage, two 250,000-gal. fuel oil storage tanks for waterworks plant; bids soon.

Lake Charles, La., 350 tons, tank.

East Chicago, Ind., 1300 tons, tanks for Wadham Oil Co.

Los Angeles, 560 tons additional, tunnel liners for Metropolitan Water District; bids April 23.

Pipe Lines

Chicago closed bids April 2 for 12,500 ft. of 2 to 4-in. standard steel pipe.

Le Center, Minn., plans natural gas steel pipe line system. Cost about \$25,000.

Carmen, Okla., plans natural gas steel pipe line, including main trunk line and distribution system. Cost over \$35,000.

John W. Moore & Son, Amarillo, Tex., plan welded steel pipe line, about 100 miles, from natural gas field district, Brown County, to Goldwithe, Lampasas, Burnet, San Saba and vicinity, including main trunk line and distribution mains. Franchise has been asked. Cost over \$750,000.

Rankin, Tex., plans steel pipe line system for gas supply and distribution in connection with new gas distributing plant.

Bowdoin Utilities Co., Glasgow, Mont., has approved natural gas steel pipe line from point near Glasgow to Fort Peck townsite of Government, about 19 miles.

A. O. Smith Corp., Milwaukee, has received order for 12-in. welded steel pipe for a 14-mile natural gas pipe line in Montana for an unnamed interest.

Wenatchee, Wash., will vote on bonds May 8 to finance construction of a 26-mile water line.

Reinforcing Steel

Awards 7555 Tons—New Projects 625 Tons

AWARDS

State of Rhode Island, 110 tons, bridges, etc., to Concrete Steel Co. and Truscon Steel Co.

Brookline, Mass., 100 tons, State road, to Joseph T. Ryerson & Son, Inc.

Lackawanna County, Pa., 120 tons, highway construction, to Kalman Steel Corp.

Lewistown, Pa., 100 tons, Viscose Co. building, to Concrete Steel Co.

Parkersburg, W. Va., 100 tons, industrial building, to Concrete Steel Co.

State of Indiana, 100 tons, paving, to Concrete Engineering Co.

Chicago, 800 tons, building for Sears, Roebuck & Co., to American System of Reinforcing.

Chicago, 600 tons, Sanitary District, to Joseph T. Ryerson & Son, Inc.

Chicago, 600 tons, Sanitary District, project No. 5, divided among Truscon Steel Co., Joseph T. Ryerson & Son, Inc., and Concrete Steel Co.

State of Illinois, 100 tons, highway bridge, to Joseph T. Ryerson & Son, Inc.

State of Wisconsin, 100 tons, highway work, to Concrete Steel Co.

Guttenburg, Iowa, 600 tons, Lock No. 10, to Kalman Steel Corp.

Breckenridge, Minn., 130 tons, school, to Cowlin Co., Minneapolis.

Grand County, Colo., 110 tons, State bridge, to an unnamed bidder.

Boulder Dam, 2900 tons, Specification No. 23,106-B, to Truscon Steel Co.

Casper, Wyo., 200 tons, canal work, to an unnamed bidder.

Oakland, Cal., 575 tons, Park Street bridge, to W. S. Wetenhall Co.

NEW REINFORCING BAR PROJECTS

Somerville-Medford, Mass., 115 tons, State bridge.

Monroe County, Pa., 275 tons, bridge and highway work; bids asked.

Rock Island, Ill., 100 tons, building at Augusta College.

Bannock County, Idaho, 235 tons, State subway; bids April 13.

Railroad Equipment

Chicago Great Western is inquiring for 500 50-ton box cars.

Chilean State Railways has ordered 15 first class passenger coaches from Bethlehem Steel Co.

Milwaukee Road has secured \$1,716,000 from PWA for 50 passenger and 25 baggage-express cars.

Interstate Railroad has signed contract for a PWA loan of \$250,000. It will rebuild 500 coal cars at Andover, Va.

Great Northern has received \$4,935,000 from PWA for repair of 6374 freight cars, 316 locomotives, and 138 passenger cars. A large portion of loan will be used for roadway and track repairs, and \$2,123,000 for new materials, including 20,000 tons of rails, tie plates, spikes, and other fastenings.

Pennsylvania has received a check for \$9,760,000 from PWA which is third instalment for completing electrification of its line between Philadelphia and Washington.

Lehigh Valley has been paid \$588,000 by PWA for repair of 60 locomotives and 2000 freight cars in its shops at Sayre and Packer-ton, Pa.

New York, New Haven & Hartford has been allotted \$330,000 by PWA for a four-car high-speed streamline train, including two cars with Diesel motors.

Gulf, Mobile & Northern is inquiring for 200 all-steel cars.

L. C. L. Corp. is inquiring for 600 all-steel cement containers.

Delaware, Lackawanna & Western has awarded 20 locomotives to American Locomotive Co., 150 steel hopper cars to Magor Car Corp., and 350 steel hopper cars to American Car & Foundry Co.

RAILS

Clinchfield has ordered 2000 tons of rails from Tennessee Coal, Iron & Railroad Co. for delivery in June.

Central of Georgia has received \$120,000 to purchase 3000 tons of rails and 142 tons of fastenings.

Great Northern has ordered 20,000 tons of rails and necessary track supplies.

Detroit Scrap Mart Has Easier Tone

DETROIT, April 10.—The exceptionally large amount of scrap now being produced by the automobile industry without an accompanying upturn in steel operations has had a depressing effect on prices in the local market. Borings and short turnings, long turnings, sheet clippings, flashings and low phosphorus plate scrap are off 25c. a ton. Heavy melting steel and hydraulic bundles are unchanged but show a weak tendency. Three boatloads of scrap, the first of the season, left Detroit for Cleveland and Lorain, Ohio, last week, and four boats are now being loaded at the local dock. Dealers predict that the volume of scrap moving out of Detroit by water this season will be the heaviest on record.

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20 years experience
Send Blueprints
for estimates
Parts scale 1" equals 2"

LANSING STAMPING CO.
SO. PENN. AVE., LANSING — MICH.

PLANT EXPANSION AND EQUIPMENT BUYING

Labor Threats to Put Break On Machine Tool Demand

If anyone needed proof of the close relationship between general labor conditions and the welfare of the capital goods industries, it would be forthcoming in the current experience of the machine tool trade. On the threat of impending labor disturbance in Detroit, machine tool orders have shrunk to insignificant proportions during the past week. What orders there are represent single tools and the urge for quick delivery in these cases indicates that most of them are in the nature of emergency requirements.

Inquiry interest in machine tools remains unabated even though orders lag; another indication that fear of labor disturbance is holding back market activity. Job work and repair parts business is at a higher level among tool builders, however, and this feature contributes to optimism for the future.

Code requirements on hours and wages in the industry are causing some concern. This, however, would no doubt be soon dispelled if customer fears of strike interruptions were allayed.

◀ NORTH ATLANTIC ▶

Concord Oil Corp., 1 Hanson Place, Brooklyn, will soon take bids on general contract for new bulk oil storage and distributing plant on Elizabeth Street. Cost over \$40,000 with equipment.

Avers Fuel Corp., 1105 Metropolitan Avenue, Brooklyn, has leased 80,000 sq. ft., at Newtown Creek near Greenpoint Avenue, for new coal storage and distribution plant, including bulk handling facilities for ocean-going steamships, etc.

Reisberg Iron Works, Inc., New York, has been organized by Jacob Reisberg, 612 East Ninth Street, and associates, to operate a structural iron works.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 17 for hacksaw tungsten blades (Schedule 2122); until April 20, corrosion-resisting steel (Schedule 2132); arc welding sets (Schedule 2149) for Brooklyn Navy Yard.

F. & M. Schaefer Brewing Co., 430 Kent Avenue, Brooklyn, plans five-story addition to recently completed three-unit plant, to be used for storage and distribution, and other service. It is understood that bids will be asked during summer. Cost over \$100,000 with equipment. Waldemar Mortensen, 103 Park Avenue, New York, is engineer.

United States Property and Disbursing Officer, Militia Bureau, Sixty-fourth Street and Second Avenue, Brooklyn, asks bids until April 17 for extensions and improvements in ordnance repair shop, equipment warehouse, two equipment storage and distributing buildings and other structures at Pine Camp, N. Y., including new loading platform and other facilities (Circular 15).

Natisch Gear Works, Inc., Brooklyn, has been organized by William Natisch, Melverne, L. I., and William Mell, 119-20 Union Turnpike, Kew Gardens, L. I., to manufacture gears and kindred transmission equipment.

Baird-Daniels Co., Inc., 36 Front Street, New York, distiller, has leased five-story building at 154 Maiden Lane, 62 x 75 ft., for new storage and distributing plant.

Superintendent of Lighthouses, St. George, Staten Island, New York, asks bids until April 16 for one to four sets engine-driven air compressors, each consisting of two engine-driven air-cooled compressors, 70 cu. ft. capacity, with air auxiliary starting compressor, etc. (Proposal 45937).

American-Irish Imports, Inc., New York, recently organized, has leased seven-story building, 33 x 90 ft., at 99-101 Beekman Street, for new storage and distributing plant for ales and liquors. Company headquarters will be established at same location.

Metropolitan Alcohol Corp., 99 Wall Street, New York, has tendered bid of \$475,000 for purchase of multi-story plant of Syrup Products Corp., subsidiary of Spreckels Sugar Corp., Yonkers, N. Y., at public sale, March 26. Purchasing company will make extensions and improvements, including equipment installation, for new alcohol distillery.

Liquid Measure Corp., New York, has been organized by Edward C. Phillips, 224 Jefferson Avenue, and Eli N. Castle, 1040 Carroll Street, both Brooklyn, to manufacture measuring machinery and equipment.

Raritan Petroleum Corp., Greensands, N. J., near Keasbey, care of L. H. Bean, 60 East Forty-second Street, New York, plans extensions and improvements in oil refinery, including equipment. Cost over \$40,000 with machinery.

Cap Screw & Nut Co. of America, Inc., 79 Polk Street, Newark, N. J., has leased main floor in building at 32-36 Green Street, for new plant, more than doubling present capacity.

Popper-Morson Co., Jersey City, N. J., liquor distiller, has leased 16,000 sq. ft. floor space in factory at 50-52 Essex Street, for new plant, for initial output of about 1000 cases a day.

E. C. Machine Works, Inc., Garfield, N. J., has been organized by Edward Calderio, 111 Sherman Place, and associates, to manufacture machinery and parts and other equipment. Company will take over E. C. Machine Shop, 125 Clark Street.

Liebert & Obert, Inc., 173 Carson Street, Manayunk, Philadelphia, has plans for addition to brewery, including improvements in present unit. New equipment will be installed. Cost over \$50,000 with machinery. Thalheimer & Weitz, 10 South Eighteenth Street, are architects.

Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until April 17 for one centrifugal blower unit (Req. S. & A. 5137).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 20 for 200 gun charging controls, 700 gun

mount adapters, 700 ejected link containers, 700 ejected case containers, etc. (Schedule 2123) for Philadelphia Navy Yard.

◀ NEW ENGLAND ▶

Clinton Distilleries Corp., Clinton, Mass., care of James E. McBride, Brookline, Mass., president, recently organized, is arranging stock issue of \$1,786,655, considerable part of proceeds to be used for new plant and equipment at first noted place.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 17 for four motor-driven headstock lathes and four sets oil pumps and piping for lathes (Schedule 2161) for Newport, R. I. Navy Yard; 40,000 zinc base castings (Schedule 2121); until April 24, dies, tools, electric candlestands, etc. (Schedule 2163) both for Portsmouth, N. H., Navy Yard.

Roberts Boiler & Iron Works, Inc., Boston, has been organized by Charles G. Keene, 156 Bellevue Street, West Roxbury, Mass., and associates, to manufacture boilers, tanks and other plate products.

Beveridge-Marvellum Co., 28 Appleton Street, Holyoke, Mass., affiliated with Beveridge Paper Co., Indianapolis, has let general contract to P. J. Kennedy & Co., Inc., Holyoke, for new three-story and basement plant at South Hadley, Mass., 40 x 50 ft., to be equipped as a solvents recovery unit and for other heavy chemical service. Cost over \$45,000 with equipment. R. E. Palmer, 7 Montgomery Avenue, Holyoke, is architect.

Rhode Island Strip Steel Co., Phillipsdale, R. I., plans new one-story plant. Cost about \$25,000 with equipment. Monahan & Meikle, 225 Main Street, Pawtucket, R. I., are architects.

State of Connecticut has plans for a machine shop and other improvements on East Lyme and Niantic State reservation. Payne & Keefe, 231 State Street, New London, Conn., are architects.

◀ WESTERN PENNA. ▶

United Refining Co., Warren, Pa., has approved plans for extensions and improvements at oil refinery, including new fractionating tower and equipment. Cost over \$80,000.

Appalachian Electric Power Co., Charleston, W. Va., will begin work soon on new hydro-electric generating plants at London and Marmet lock and dams of Government, Kanawha River. In addition to main power plants, project will include transmission lines, substations, etc. Cost over \$4,000,000 with equipment.

Carnegie Metals Co., Oliver Building, Pittsburgh, recently reorganized, has arranged for sale of capital stock totaling \$100,000, majority of fund to be used for developments in company ore-mining properties in Mexico, including additional machinery. Power house will be remodeled. S. A. Taylor is president.

◀ OHIO AND INDIANA ▶

Firestone Tire & Rubber Co., South Main Street, Akron, Ohio, has let general contract to Hunkin-Conkey Construction Co., Cleveland, for two-story and basement factory branch, storage and distributing plant, 130 x 190 ft., at Cleveland. Cost over \$100,000 with equipment.

National Brass & Copper Co., Lisbon, Ohio, has been acquired by new interests, headed by C. W. Hayes, Mount Lebanon, Pa., and associates, who will take immediate possession. Improvements will be made. Berthold Goldsmith, heretofore active in management, will retire from business.

Ball Lift Corp., Akron, Ohio, care of George B. Ball, Akron, president, recently organized, is arranging for stock issue of \$125,000, part of fund to be used for plant and equipment for manufacture of mechanical lift devices and similar equipment. E. V. Hampton, Akron, is secretary and treasurer.

Village Council, Minerva, Ohio, plans extensions and improvements in municipal elec-

tric light and power plant, about \$25,000 to be expanded for new equipment.

Electro Hydraulic Machinery Co., Akron, Ohio, has been organized by Paul Zarra, D. L. Van Buskirk, 402 Ohio Building, and associates, to manufacture hydraulic machinery and parts.

Contracting Officer, Material Division, Wright Field, Dayton, Ohio, asks bids until April 17 for bomb rack assemblies, bomb release handle assemblies and flare assemblies (Circular 416), oil barrel cradle assemblies in lots of 40, 60 or 80 (Circular 414); until April 20, sheet and rod brass (Circular 423); until April 24, 84,000 slotted engine nuts (Circular 426).

General Electric Co., Incandescent Lamp Department, Nela Park, Cleveland, plans installation of additional equipment at branch plant at Niles, Ohio, including new recuperative tank furnace and accessories. Cost about \$45,000.

Board of Public Works, Goshen, Ind., plans call for bids for three electric pumping units, two gas or Diesel engine pumping units, 500,000-gal. capacity elevated steel tank and tower, pipe lines, etc., for municipal waterworks. Fund of \$150,000 has been arranged. Charles Brossman, Chamber of Commerce Building, Indianapolis, is consulting engineer.

Kroghman Distilling Co., Tell City, Ind., has let general contract for new three-story and basement plant to J. D. Jennings, 443 Garden Street, Louisville. Cost over \$100,000 with equipment.

Pressure Castings, Inc., Cleveland, has established a plant at 12435 Euclid Avenue for the manufacture of die castings. Company was recently organized with a capital stock of \$35,000. David Benjamin is president and secretary, Nathan Lester, vice-president, and W. R. Rosenfeld, treasurer.

◀ BUFFALO DISTRICT ▶

Hammondsport Vintage Corp., Hammondsport, N. Y., has approved plans for addition. Cost about \$75,000 with equipment. Company is a subsidiary of Distillers & Brewers Corp. of America, Inc., 21 West Street, New York.

Dominion Natural Gas Co., Winger, Ont., plans rebuilding compressor plant near city, recently destroyed by fire. Loss about \$50,000 with gas engines, compressors and accessories.

Board of Education, Utica, N. Y., plans manual training department in new multi-story high school in East Utica district. Fund of \$1,221,000 has been secured through Federal aid. Bagg & Newkirk, Utica Gas & Electric Building, are architects.

◀ SOUTH CENTRAL ▶

Bernheim Distilling Co., Louisville, will build five multi-story additions to two local plants for storage and distribution, in addition to other structures recently noted; also new bottling plant. Entire program will cost over \$1,000,000 with equipment. A. W. Browne is secretary and treasurer.

Wiedemann Brewing Corp., 601 Columbia Street, Newport, Ky., plans additions and improvements in present plant, including equipment for brew-house, bottling and other departments. Cost about \$200,000 with machinery. Alfred Mackay, 110 East Forty-second Street, New York, is consulting engineer.

Town Council, Mooringsport, La., plans installation of pumping machinery and auxiliary equipment, pipe lines, etc., for municipal waterworks. A bond issue of \$35,000 has been authorized.

Commanding Officer, Ordnance Depot, Fort Knox, Ky., asks bids until April 16 for one 120 cu. ft. per min. air compressor (Circular 9), one electric ball-bearing floor grinding machine (Circular 10), and one universal grinding machine (Circular 11).

Louisiana Products Corp., Commercial Bank Building, Shreveport, La., E. G. Palmer, vice-president, has plans for first unit of new lime and chemical works near Winnfield, La., where large tract has been purchased. Power house and machine shop will be built. Other units will be erected later. Cost about \$600,000 with machinery.

Tennessee Valley Authority, New Sprinkle Building, Knoxville, Tenn., asks bids until April 20 for material-handling equipment for fertilizer works, Nitrate Plant No. 2, Sheffield, Ala., including bucket elevators, clod breakers, belt conveyors, drag conveyors, power shovel, etc.

◀ MICHIGAN DISTRICT ▶

Leonard Refrigerator Co., Grand Rapids, Mich., plans two-story addition, 200 x 450 ft. Cost over \$100,000 with equipment. J. H. Deenan is company engineer. Company is affiliated with Kelvinator Corp., Detroit.

Frankenmuth Brewing Co., Frankenmuth, Mich., has plans for new multi-story brewery. Cost about \$100,000 with equipment.

Hydro-Stamping & Mfg. Co., Inc., 5727 Mount Elliott Avenue, Detroit, has been organized by Hans G. Warnke, 6126 Bishop Avenue, Grosse Pointe Park, and associates, to manufacture metal stampings and kindred equipment.

Gar Wood Industries, Inc., 7924 Riopelle Street, Detroit, formerly Wood Hydraulic Hoist & Body Co., manufacturer of motor truck bodies, hoists, etc., has begun two-story addition to body manufacturing plant. New equipment will be installed.

◀ SOUTHWEST ▶

Missouri Breweries, Inc., St. Louis, recently organized, care of George R. Bartling, 4549 Westminster Street, architect, plans new four-story and basement plant, 230 x 425 ft., with power house, machine shop and other mechanical units. Cost about \$250,000 with equipment. R. Shad Bennett, 818 Olive Street, is company representative.

United States Engineer Office, Postal Telegraph Building, Kansas City, Mo., asks bids until April 16 for six cast steel spuds and nine cast steel spud extensions (Circular 65), 16 spud-lifting clamps (Circular 66); until April 19 for electric power substation at Fort Peck dam site, Missouri River, near Glasgow, Mont. (Circular 71).

Ramsey Accessories Mfg. Corp., 3693 Forest Park Boulevard, St. Louis, manufacturer of automobile equipment and parts, has let general contract to Atlas Construction Corp., 817 North Ninth Street, for one-story top addition, 75 x 180 ft. Cost about \$50,000 with equipment.

Board of Education, Chickasha, Okla., plans manual training department in new multi-story high school, replacing a unit now being demolished. Cost about \$250,000. Paul Harris, Chickasha, is architect.

Skelly Oil Co., Skelly Building, Tulsa, Okla., plans new gasoline refinery on lease of Midco Oil Corp., near Burbank, Okla., oil field. Cost close to \$100,000 with equipment.

Anheuser-Busch, Inc., 721 Pestlozzi Street, St. Louis, brewer, has leased building at 2617 Leeland Avenue, Houston, Tex., for new branch plant, with storage and distributing departments.

◀ MIDDLE WEST ▶

Aeronautics Branch, United States Department of Commerce, Washington, has leased one-story building at 1836 South Kostner Avenue, Chicago, 16,800 sq. ft. space, for branch works for constructing, testing and repair of airways lighting equipment, radio apparatus, generating equipment, also aircraft parts storage and service unit.

Town Council, Royal, Iowa, asks bids until April 17 for pumping machinery, 30,000-gal. capacity elevated steel tank and tower, pipe lines, etc., for municipal water system. Buell & Winter Engineering Co., Sioux City, Iowa, is consulting engineer.

Department of Public Property, Springfield, Ill., Willis J. Spaulding, commissioner, will take bids soon for equipment for municipal electric light and power plant. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Nevinger Mfg. Co., Greenville, Ill., has been organized by W. K. and R. M. Coates, officials of Coates Steel Products Co., Greenville, as an affiliated interest, to manufacture oil-burning equipment and devices, water-heating equipment, etc.

Capital City Brewing Co., Bismarck, N. D., care of G. F. Weinrich, New Salem, N. D., president, recently organized with capital of \$350,000, plans main multi-story brew-house and bottling works, also smaller units, at Bismarck. Cost over \$100,000 with equipment. Welton L. Merry, Dickinson, N. D., is secretary.

Roberts & Oake, West Forty-fifth Street and South Racine Avenue, Chicago, meat packers, have awarded general contract to H. A. Maine

Construction Co., Waterloo, Iowa, for rebuilding two-story branch plant at Marshalltown, Iowa. Cost about \$60,000 with equipment. H. P. Henschien, 59 East Van Buren Street, Chicago, is architect and engineer.

Village Council, Harmony, Minn., asks bids until April 20 for one 75,000 to 100,000-gal. capacity elevated steel tank on 80-ft. steel tower for municipal waterworks. Ealy G. Briggs, 1520 Hythe Street, St. Paul, Minn., is consulting engineer.

Globe-Union Mfg. Co., 900 East Keefe Avenue, Milwaukee, manufacturer of storage batteries, radio parts and devices, roller skates, etc., has placed contracts for an extension, 80 x 150 ft., one-story, designed by George Schley & Sons, 735 North Water Street. Cost \$35,000 complete.

Gudmundsen-Stratton Laboratories, Milwaukee, have been organized by Austin Gudmundsen, formerly associate director, physical research, A. O. Smith Corp., and Chester M. Erwin, industrial chemist, to manufacture water purification plants. Headquarters have been established at 342 North Water Street.

G. E. Cunningham, 101 East Wisconsin Avenue, Janesville, Wis., agent for unnamed interest, has purchased plant, property, etc., of defunct Northern Conveyor & Mfg. Co., Janesville, at receiver's sale for \$5,000, subject to encumbrances. Plans for resumption of production are under consideration.

◀ WASHINGTON DISTRICT ▶

Town Council, Floyd, Va., plans installation of electric pumping machinery and auxiliaries, steel standpipe and other equipment, pipe lines, etc., for municipal water system. J. B. McCrary Engineering Co., Atlanta, Ga., is consulting engineer.

General Purchasing Officer, Panama Canal, Washington, asks bids until April 19 for twist drills, hand taps, crosscut saws, carpenter's hammers, clay picks, ship scrapers, garden hoes, conduit bushings, steel buckle plates, water gages and other equipment (Schedule 2953).

Owings Mills Distillery, Inc., Reisterstown Road, Owings Mills, Md., recently organized, has let general contract to B. H. Maas Co., 1119 Ensor Street, Baltimore, for addition. Cost over \$35,000 with equipment. Other distillery units are being arranged. Proposed to have plant ready for service in 30 to 60 days. J. J. Landsburgh is president.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 17 for one motor-driven jig borer, with accessories (Schedule 2167) for Norfolk, Va., Navy Yard; brass and copper pipe and tubing (Schedule 2129) for Brooklyn, Sewall's Point and Mare Island yards; two oil-fired boilers complete with burners (Schedule 2124-R) for Thorne Navy Yard; steel rivets and washers (Schedule 2061), pump regulators (Schedule 2104) for Eastern and Western yards.

◀ SOUTH ATLANTIC ▶

Southern Wheel Co., Hemphill Avenue, N. W., Atlanta, Ga., manufacturer of car wheels, etc., has let general contract to Pittman Construction Co., Rhodes Building, for one-story addition. Cost about \$25,000 with equipment. Company is affiliated with American Brake Shoe & Foundry Co., New York.

Superintendent of Lighthouses, Key West, Fla., asks bids until April 30 for metal work for six iron structures for Hillsboro Bay and Tampa Bay, Fla.

Common Council, Summerton, S. C., plans installation of pumping machinery and other equipment, pipe lines, etc., for new municipal water system. Fund of \$37,000 has been arranged through Federal aid. Ryan Engineering Co., Columbia, S. C., is engineer.

City Council, Albemarle, N. C., asks bids until April 18 for steel stand pipe, 5000-gal. capacity, for municipal water system. William C. Olsen, Raleigh, N. C., is consulting engineer.

◀ PACIFIC COAST ▶

Santa Cruz Portland Cement Co., Crocker Building, San Francisco, plans new storage and distributing plant at foot of Webster Street, Oakland, Cal. Cost about \$100,000 with equipment.



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Fairbanks-Morse pioneered many of the standards of the present-day motor building industry.

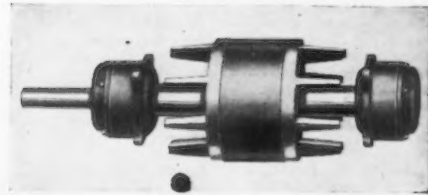
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These motors meet the most exacting electrical specifications. But with characteristic thoroughness, Fairbanks-Morse has achieved a position of leadership in *mechanical* construction.

Fairbanks-Morse pioneered *mechanical excellence* in electric motors. It pioneered *ball bearings, grease tube lubrication, one-piece rotor construction*.

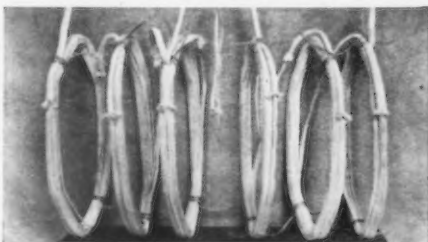
Pioneers in motor building progress, Fairbanks-Morse asks only an investigation of how much *more* these motors have to offer. Start your investigation by writing for full information. Address Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill.



Complete rotor assembly with cartridge-type sealed ball bearings. Note rotor winding is of one-piece construction.



Lubricate sealed ball bearings once a year with tube contained lubricant. Bearings, dust tight. No lubrication drip.



Group wound coils—an entire phase group in a single piece of wire—lead connections from each group welded, not soldered or brazed.



Sealed-in leads through frame opening—anchored permanently. No chance for strain on field leads.



Slot-insulation — self-locking by means of cuff construction — permanent and additional protection for field windings.



Final vibrometer test—one of a series to insure a smooth running motor with minimum vibration.

**Pioneer
Designers
and
Manufacturers
of**



**FAIRBANKS-MORSE
MOTORS**

POWER, PUMPING AND WEIGHING EQUIPMENT

104 Years

EA 4062

Comstock-Dexter Mines, Inc., Prescott, Ariz., care of T. F. M. Fitzgerald, Prescott, president, recently organized, is planning development of local gold-mining properties, with installation of mining machinery, hoisting and loading equipment, etc. A stock issue of \$125,000 has been authorized, considerable part of fund to be used for purpose noted. A. L. Fitzgerald, Prescott, is secretary and treasurer.

David O. Pratt, 722 Queen Anne Avenue, Seattle, representing a new company whose name is temporarily withheld, has arranged for acquisition of waterfront site at Edmonds, Wash., for new distilling plant, to include power house, machine shop and other departments. Cost over \$85,000 with machinery.

Board of Education, Long Beach, Cal., has plans for new junior high school group at Jefferson junior high school site, with vocational training shops. Cost about \$450,000

with equipment. W. A. Dedrick, Heartwell Building, city, is architect.

Sonoma Valley Brewing Corp., Exchange Bank Building, Santa Rosa, Cal., has plans for new four-story brewery, 90 x 120 ft., with power house and other mechanical units. Cost about \$160,000 with machinery.

Commercial Boiler Works, West Lander Street, Seattle, plans rebuilding part of boiler and tank plant recently destroyed by fire. Loss over \$100,000 with equipment.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until April 17 for circuit breakers, ammeters, etc. (Schedule 2087); until April 20, 16 turbine-driven generators, 16 automatic voltage regulators and spare parts (Schedule 2093) for Puget Sound Navy Yard; 12 pneumatic drills, 100 pneumatic scaling hammers and 15 pneumatic grinders (Schedule 2135) for Mare Island Yard.

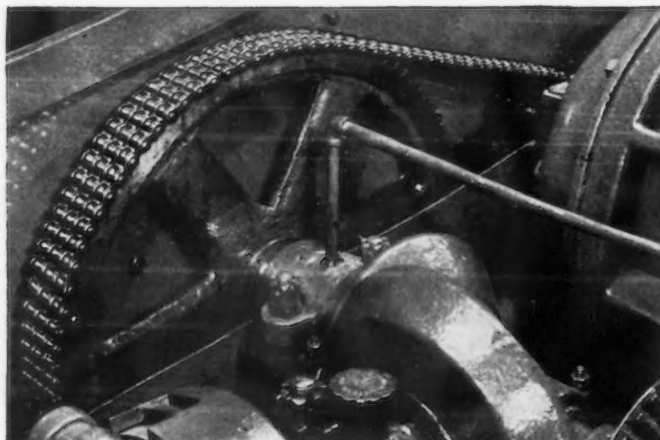
◀ FOREIGN ▶

Ministry of Communications, Government of Brazil, Rio de Janeiro, Brazil, plans new airport with hangars, machine shop, oil storage and distributing buildings and other field units, in connection with dirigible passenger and mail service between Brazil and Europe, for which arrangements have been made with Zeppelin Co., Berlin, Germany. Last noted is interested in airport and hangar program. Brazilian Government has authorized fund of 11,000 contos (about \$940,000) for latter project, including equipment.

Paper and Pulp Trust, Soviet Russian Government, Moscow, U.S.S.R., plans two pulp and paper mills at Bashkir and Krasnoyarsk respectively, each with power stations, machine shops and other mechanical departments. New cellulose-paper mills are also proposed at Kama and Kondopoga. Entire project will cost over \$3,000,000 with machinery. Amtorg Trading Corp., 261 Fifth Avenue, New York, is official buying agency.

Supply and Tenders Committee, Department of Public Works, Wellington, New Zealand, asks bids until May 29 for one 33,000-kw. transformer with accessories for Lake Coleridge power project; until June 5, for electric storage batteries and charging equipment.

Knowing Steel, you can appreciate the Stamina of CHAIN DRIVES



DIAMOND Roller Chain Drives are made of steel. Knowing steel, you know the significance of that single fact. But in addition, the Diamond design permits the use of tough steel where tensile strength is vital; wear-resisting steel for bearing surfaces as between pin, bushing and roller, and sprocket.

You can also appreciate the fact that chain drives are the only positive drive that is practical over both short and long centers. Hence they are the only method of assuring permanently correct speed ratios between separated units of equipment.

If you do not have the latest information on anti-friction, high-efficiency Diamond Roller Chain Drives, ask for new 96-page Catalog No. 583. **DIAMOND CHAIN & MFG. CO.**, 433 Kentucky Ave., Indianapolis, Ind. *Offices and Distributors in All Principal Cities.*



Get your
copy of
New Catalog
No. 583

DIAMOND CHAIN

ROLLING ~ AT POINTS OF CONTACT

TRADE NOTES

Superheater Co., New York, announces that the following of their agents for stationary superheaters, economizers, furnace water walls and other Elesco steam plant equipment have now been appointed sales agents for Ljungström air preheaters: Combustion Equipment Co., 1820 Cherry St., Kansas City, Mo.; F. J. Hearty, 74 New Montgomery St., San Francisco; Walter Castenedo, Inc., 329 Balter Bldg., New Orleans; J. W. Eshelman, 908 Martin Bldg., Birmingham; J. S. Cothran, 909 Commercial Bank Bldg., Charlotte, N. C.; Rees V. Downs, 422 Exchange Bldg., Memphis, Tenn.; Haylett O'Neill, 1507 Post Dispatch Bldg., Houston, Tex.; Joy and Cox, Inc., 1940 Blake Street, Denver.

R. E. Chase & Company, with offices at 3322 White-Henry-Stuart Building, Seattle, Wash., and 503 Tacoma Building, Tacoma, Wash., who are sales agents for The Air Preheater Corporation, have now also been appointed by The Superheater Company as their sales agents for Elesco steam plant equipment.

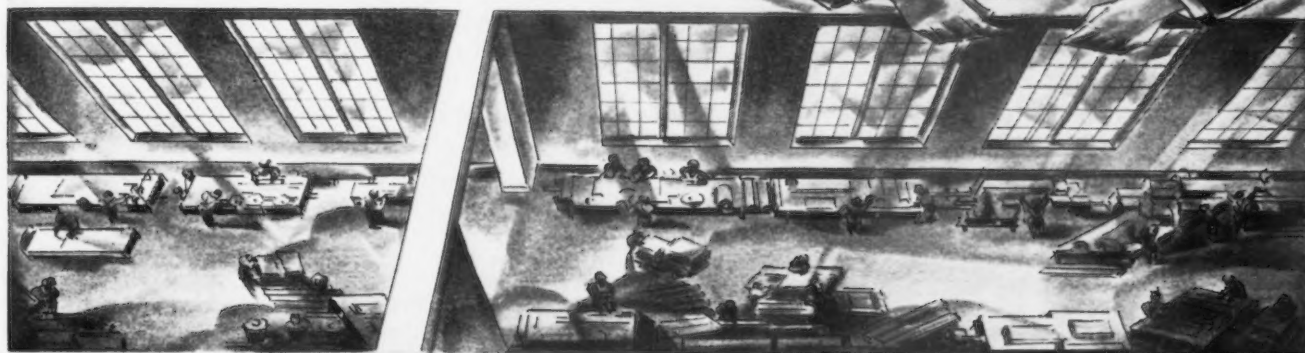
City of Springfield, Mass., has for the second time, endeavored to auction Arcade Malleable Iron Co. plant on Page Boulevard, for non-payment of taxes from 1929. No bidders appeared. City indicates it will continue efforts to dispose of the property unless back taxes are paid.

Republic Metals Corp., Brooklyn, has opened office and warehouse in Los Angeles, office being at 308 East Ninth Street, and warehouse at Ninth and Alameda Streets. Company expects to manufacture on Coast in about 60 days, and has purchased all necessary equipment. Fred Williams is sales agent.

Mesta Machine Co., Pittsburgh, had in 1933 net profit, after all deductions, of \$630,678, compared with \$327,870 in 1932.

Foster Wheeler Corp. has acquired from the Riley Stoker Corp., Worcester, Mass., exclusive right to manufacture and sell Riley fuel burning apparatus for use in Dominion of Canada.

Cap Screw & Nut Co. of America, Inc., New York, is moving Newark, N. J., warehouse to 32 Green Street, Newark, on or about May 1, where a more complete and diversified line of all types of bolts, nuts, screws, washers and rivets will be carried.

LOOK INSIDE**YOUR PLANT***For profits!****Examine Your Materials Handling Methods through Critical Eyes!***

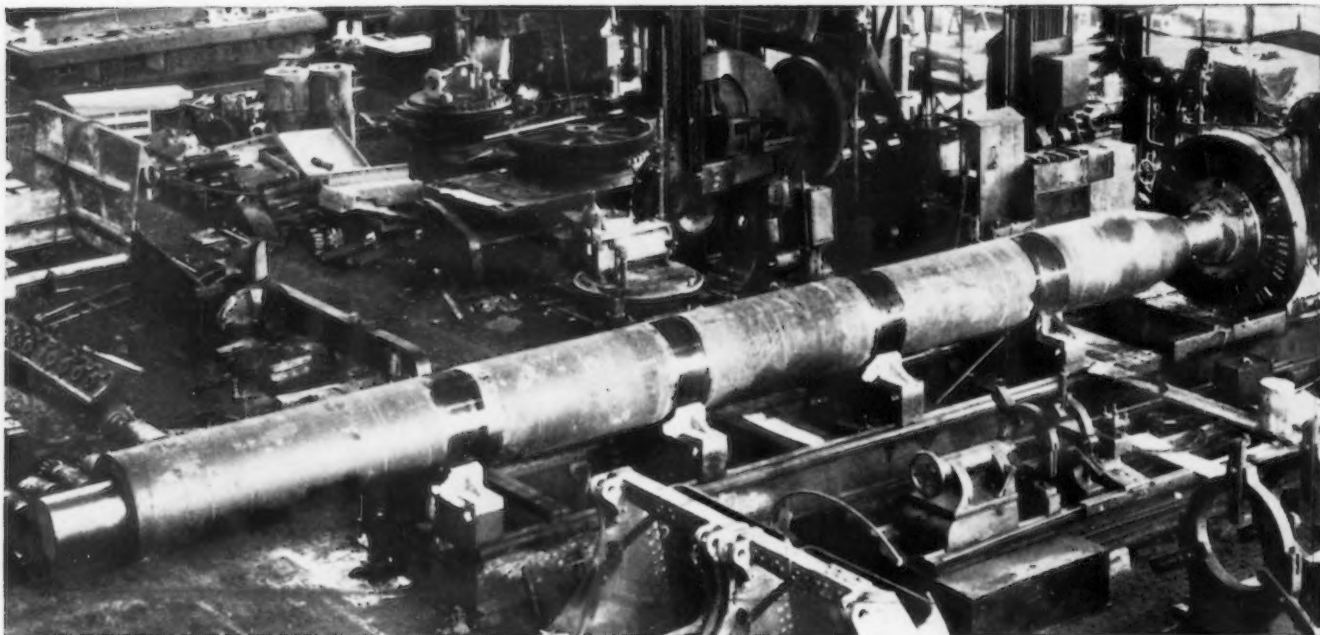
Are your methods inadequate or obsolete? Is your materials handling tied into production properly? Can you gain more productive space or storage capacity by the use of Osborn Tramrail Systems?

Your conditions may require one unit, a combination of units, or a complete Osborn Tramrail System. A survey . . . without cost or obligation to you . . . will determine the correct type and amount of equipment you need. Before you invest in any kind of materials handling equipment investigate Osborn Tramrail Systems!

THE OSBORN MANUFACTURING COMPANY
5401 HAMILTON AVENUE, CLEVELAND, OHIO, U.S.A.



OSBORN
TRAMRAIL SYSTEMS



Massive Bending Roll Repaired By Thermit Welding

FRACTURED recently in service at a large Eastern mill, the bending roll here pictured was permanently repaired by means of Thermit welding. In addition to the massiveness of this machine member, which is 36 in. in diameter, 42 ft. long and weighs 80 tons, the slight effect of the welding upon the alinement is a feature. Careful measurement is said to have shown the finished roll to be only $\frac{3}{64}$ in. out of line.

The fracture occurred near one end of the roll. Preparation for welding included alining the broken sections as near perfectly as possible and cutting out the fracture with torches to provide a 2½-in. wide gap for the weld metal. This done, a 6-ft. x 6-ft. x 40-in. mold box was constructed around the break and then a brick furnace was built on each side of the mold box to provide adequate preheating of the massive roll. By-prod-

uct gas was used for the early stages of preheating. After the heating operation, which required 54 hr., 3300 lb. of Thermit in two large crucibles was reacted. Forty-five seconds later the weld was poured.

When the weld was thoroughly cooled the gates and risers of weld metal were cut away, and the roll was placed in a lathe for machining off the entire collar of Thermit steel. Cost of the entire repair, including the dismantling, preparation for welding, welding, machining and remounting of the roll in the bending machine ready for service, was \$3,900, which is said to be less than one-third of the estimated cost of a new roll.

Rules for Welding Work That Is to be Porcelain Enameled

SOURCES of trouble in oxy-acetylene welding of work that is to be porcelain enameled are discussed by L. B. Hart, Ferro Enameling Corp., in the March issue of *Enamelist*. He lists materials, design and forming, welding equipment and welders as the sources of troubles. Materials for welding and enameling should be free from segregated impurities and gas-forming materials which expand when the flame heats the steel to molten temperature, leaving porous spots and holes in the weld. Frequently rough honeycomb spots will be produced which, if not worked down, will show through numerous coats of enamel. Cleaning the piece to remove oil, drawing compound and other contamination before welding helps to correct this condition.

A product should be so designed

that the greater portion of the weld consists of the base metal alone, whether it is butt or lap-welded. The reason for this is that when filler metal is added there is always the possibility of oxides being entrapped in the metal, which causes a blister in the weld when the part is fired, which it is difficult to cover with porcelain enamel. When filler metal is required a welding wire similar in analysis to the piece being welded should be used and, if sheared strips are used for filler, they should be sheared from the sheet metal that is being welded.

The writer emphasized the importance of having properly designed jigs and clamps, which in addition to holding the parts in place must also conduct heat out of the work. In light-gage material, expansion and contraction can be resisted or made to expand its efforts in the welded seam

itself. Clamps which permit little play in the sheet allow the expansion and contraction to be taken up in the weld. Water-cooled jigs carry away sufficient heat and resist the expanding action so that there is little distortion in the sheet itself. It is essential to use a neutral flame in welding seams that are to be porcelain enameled. Controlling the pressure of gases from gages and not by using adjusting valves on the torch helps the operator to maintain a neutral flame.

Among common sources of trouble for the enameler is a weld produced with an oxidizing flame, as the weld develops small bubbles or blisters when porcelain is applied. A reducing or carburizing flame increases the carbon in the weld metal and causes the same condition. The writer recommended use of Nos. 3 and 4 tips for welding 19 and 20-gage sheets and No. 5 tip for 18-gage sheets. However, in his opinion, the size of the tip is of not so much importance as the skill of the welder, correct adjustment of the torch and the proper jigs and holding fixtures.

RUBBER

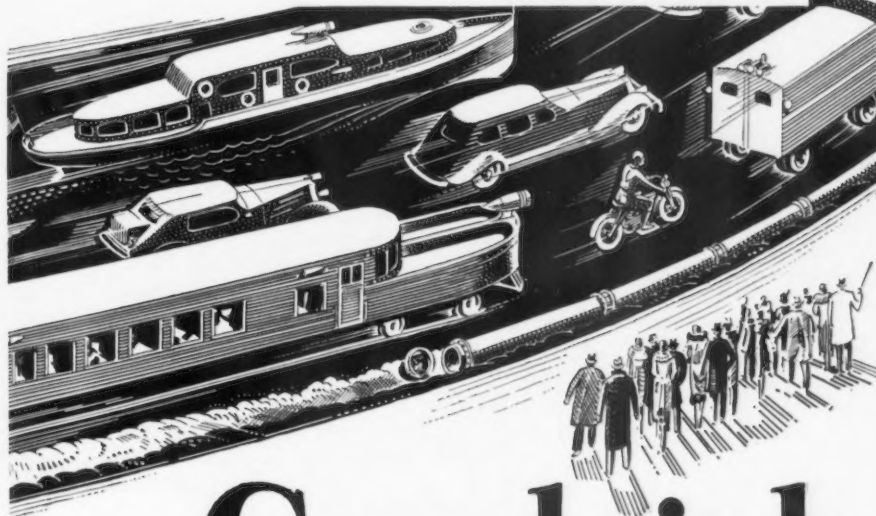
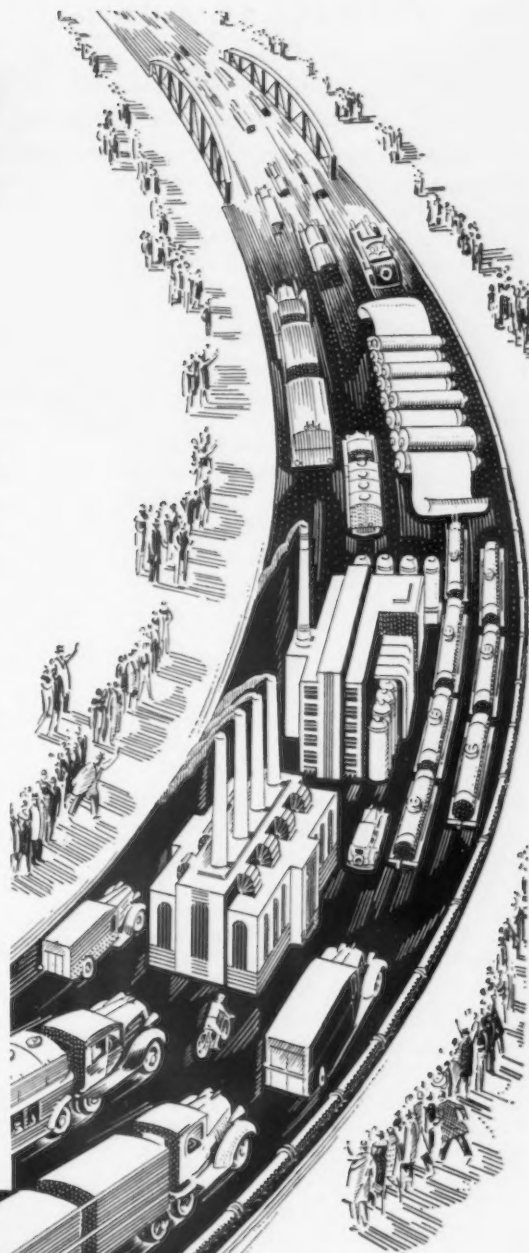
on the March

A MAKER of toy automobiles changes metal wheels to rubber... and sales leap. Railroad trains and automobiles cry for speed, but speed brings disastrous vibration—until rubber absorbs it. Marine propeller-shaft bearings have been cursed with short life—until bronze is replaced with soft rubber, and life is increased ten times.

Paper is made better and cheaper with rubber rolls. Transcontinental pipe lines become practical because of rubber gaskets. Bridges become safer with rubber expansion joints. Accidents and depreciation both are cut in chemical plants when rubber-lined tanks are perfected.

These and a thousand other developments are the work of Goodrich application engineers, making good their promise—All Products and All Problems in Rubber.

In almost every industry and every enterprise, rubber in one of its countless forms has a part—or *should have*. Today rubber can be so made that it will flex countless times, will adhere to metal, will last for years, and will resist abrasion, chemicals, heat, oxidation. If what you make or use could benefit by one or more of these qualities, Goodrich can show you the way . . . The B. F. Goodrich Rubber Company, Mechanical Rubber Goods Division, Akron, Ohio.



Goodrich

ALL *products problems* **IN RUBBER**

Competent Goodrich engineers are prepared to demonstrate the adaptability of rubber to practically any mechanical device; and are ready to cooperate with responsible manufacturers, exploring the possibilities of rubber in the development and design of their products.



GOODRICH MECHANICAL RUBBER GOODS ALREADY INCLUDE . . .

Conveyor, Elevator and Transmission Belting . . . Air, Steam, Water and Suction Hose . . . Rubber Lining for Storage, Pickling and Plating Tanks, Tank Cars, Pipe and Valves . . . Packing . . . Molded Rubber Products . . . Heels and Soles . . . and a Complete Line of Miscellaneous Rubber Items.

Attractive Finish Helps Metal Products Sales

(Concluded from Page 19)

and buffing. Its purpose is to roll down the tiny ridges left after polishing and thus to reduce the operation of cutting down, which, as mentioned, is a true buffing process employing tripoli.

Coloring Compounds

For final coloring, aluminum oxide or chromium oxide compounds are most popular. These both have some cutting action as well as coloring. The chromium oxide compound is more expensive, but produces less friction and gives a true blue color to Monel metal and nickel. Some special compounds combining the advantages of tripoli and a coloring compound like chromium oxide are available but usually the use of these compounds is an expedient to reduce the expense of buffing and is used at some slight sacrifice in the final finish.

One compound put out by the Lea Mfg. Co., Waterbury, Conn., is extensively used on small articles and is said to produce a satin finish with a total of fewer operations and therefore with less overall expense than by most other methods. Certain grades of this compound are advised for removing marks left by No. 150 emery.

Many manufacturers make up their own compounds and some of these give excellent results. One of these is a paste made up of one part No. FF pumice powder and one part No. F emery mixed with machine oil. Rock pumice and carbon tetrachloride are used to offset the effect of grease. Soap bark powder mixed with warm water is sometimes used to secure a smooth finish and to protect the metal. Venetian lime sparingly applied to soft flannel buffs is used as the final buffing operation to remove the last trace of grease. The color on a high luster finish is such a delicate process that a change in the direction of the rotation of the wheel in its relation to the movement of the work produces a marked change in effect.

Adjusting the Buff

Buffing wheels expand appreciably, due to centrifugal action when in use, and for this reason some experience is required in setting a wheel on a buffing machine for a given piece of work. Usually the wheel is brought down to just touch and then is fastened in place, the expansion of the wheel giving sufficient pressure. It is impossible to force a buffing

wheel, and each combination of compound and operation has a definite maximum speed and pressure. If these are exceeded, the desired result will be lost. One manufacturer who has standardized the buffing of automobile rear fender brackets uses a pressure of 28 lb. between the work and the wheel, and a surface speed of the buffing wheel of 7500 ft. a minute. This manufacturer finds that the addition of a small amount of oil during buffing helps the action.

Generally speaking, the higher the speed of the buffing wheel the brighter the finish, but a large wheel traveling at a high rate of speed will not cut down as fast as a smaller wheel at a slower speed. For cutting down, surface speeds between 5000 and 6500 ft. per minute are the general practice. For producing satin effects, speeds of from 3000 to 5000 ft. per minute are common. This means that for a 10 in. buff, speeds should range from 1200 to 1800 r.p.m.

Buffing Different Metals

The crystalline structure of metal determines to some extent the nature of the final finish, although the natural effect may be altered by using different grades of compound and different sizes and types of wheels. A loose buff with dry compound will produce a frosted effect on soft annealed aluminum, while on hardened steel a sewed muslin buff will produce a high polish. Buffing of stainless steel is a particularly difficult problem and details of this technique will be described in a later article.

Some of the chief variables in buffing include the design of the buffing wheel, the quality of the fabric, and the compound. The Hanson-Van Winkle-Munning Co., Matawan, N. J., recently put out a new type of buff claimed to effect a reduction in buffing costs. A feature of this new wheel is that the fabric disks instead of remaining flat are folded so as to produce a buff with many openings permitting dissipation of heat. Another advantage claimed for this new wheel is a greater width of surface with less material. For instance, a surface 26 plies wide may be secured from 18 disks. Special grades of buffing compounds are developed for special materials, thus one is designed for sterling silver, another grade for cadmium, and another for bronze.

Mr. Louis Hague of the Hanson-

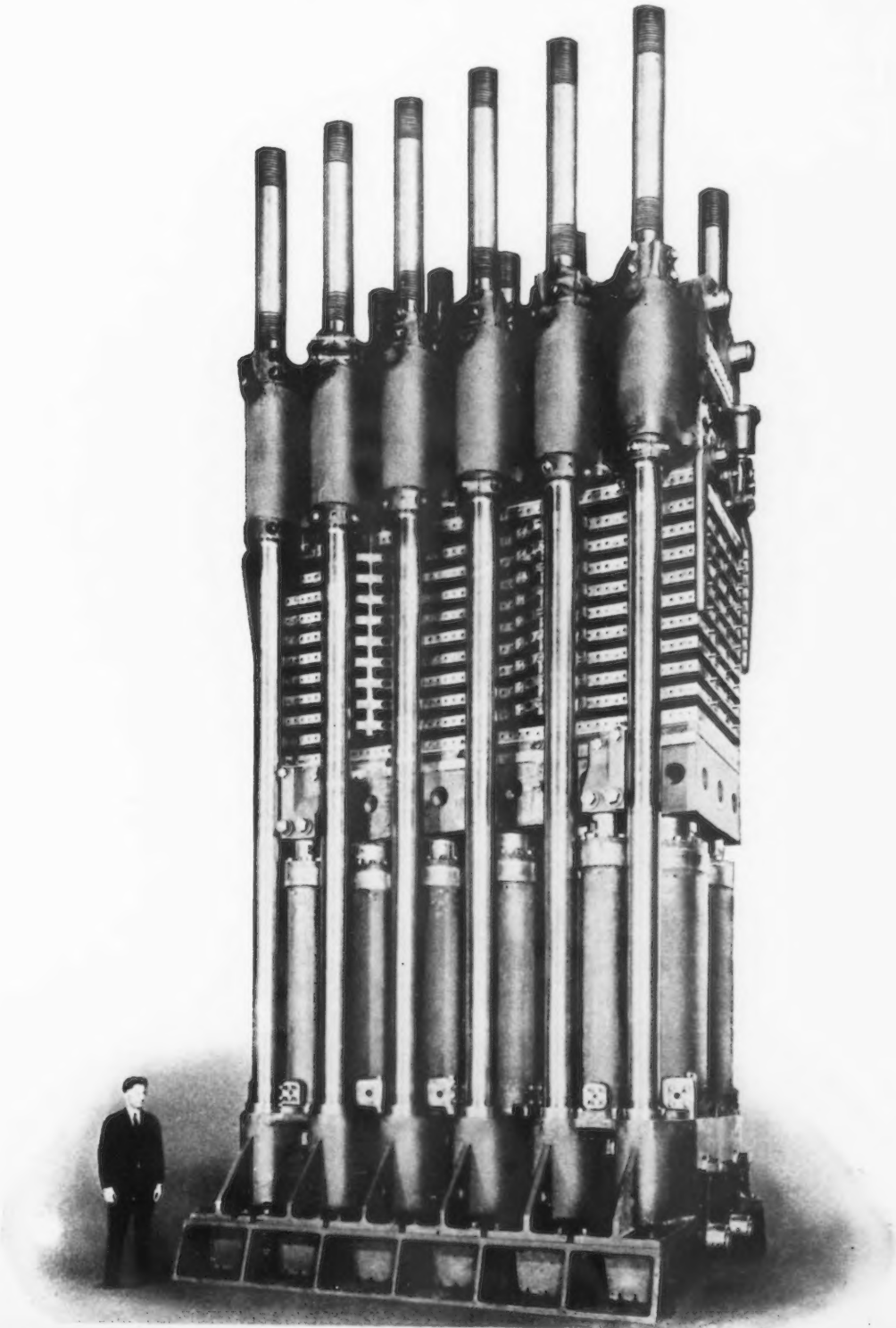
Van Winkle-Munning Co., who has given a great deal of attention to the study of buffing compounds, gives as the more common cutting abrasives emery, tripoli, diatomite, pumice, and flint, and lists the coloring abrasives in order of their hardness as soft silica, Venetian lime, metallic oxides such as crocus and the red and black rouges, oxides of chromium known as green rouges, and putty powder. Mr. Hague describes a typical buff as consisting of disks of cotton cloth. A loose buff he describes as made up of full disks stitched in sections with a single row of sewing around the arbor hole. The so-called sewed buffs are generally full disks either spirally or concentrically sewed. The lines of sewing are about $\frac{1}{4}$ in. apart over the entire surface. This gives greater stiffness and resistance to bending when in contact with the work.

A third type of buff is known as a piece-sewed buff which is made up of pieces too small to be cut into disks. These are overlapped and sewed together and finally are cut into disks and made up along conventional lines. The sewing in the plants of large manufacturers is an ingenious automatically controlled multi-needle operation which frequently produces 1000 stitches per minute. Mr. Hague points out the importance of having a balanced buff, which he says may be operated as high as 12,000 surface ft. per minute. An off balance gives a pounding action which may destroy the luster effect.

Many special buffs are produced. Some have cardboard disks between the sections of cloth. Woolen buffs at low speeds are used on precious metals where a minimum amount of metal must be removed. Jewelers' buffs are usually hardened at the centers with shellac or glue. Buffs may be cleaned during operation by applying a buff stick to the face. This stick is merely a piece of wood coated over with glue and allowed to dry, then rubbed over with pumice, again coated with glue, and finally set up with alumina grit.

The amount of composition on the buffing wheel is important and should be applied in a small amount at a time with light pressure. Separate wheels should be used for cutting down and for coloring. The latter require higher peripheral speeds. Work is usually washed after final finish to remove traces of grease. The longer it is left to stand after final buffing, the harder is this grease to remove. It is claimed for some of the Lea compounds that no grease is left and that washing preliminary to lacquering may be eliminated.

THIS 7500-ton hydraulic ten-opening board press was designed and built by R. D. Wood & Co. of Philadelphia, Pa., at its works in Florence, N. J. Due to its rugged construction, the maximum deflection at any point on the platen area does not exceed .002". The stroke of the rams and the extended columns permit increasing the number of its openings to twenty at any future time. The steam plates are 54" wide and 150" long. We invite your inquiry on hydraulic presses of all sizes for every purpose. Write us at 400 Chestnut Street, Philadelphia.



R. D. WOOD & CO. 400 CHESTNUT STREET
ESTABLISHED IN 1803 PHILADELPHIA

Mass Effect and Quality In Steel Making

(Concluded from Page 15)

parently all metallurgical processes and properties of iron and steel.

The very recent work of Albert Portevin, professor of the École Centrale at Paris, on the thermodynamics of the refining periods of steel-making processes is in full accord with the foregoing deductions. Thus, the velocity of metallurgical reactions between liquid phases is predominantly a function of strictly chemical reactions (i. e., the difference of composition of the phases prior and at equilibrium), the area of contact surface and of the movements of the molecules as

well as of the viscosity of the phases, which latter naturally depends upon the temperature of the bath and its composition. Excepting the chemistry of steel-making processes all other items are inherent to the individual melting procedure.

Conclusions

TAKING the previously outlined facts into account, a more thorough understanding of the mass effect in steel making seems to warrant every possible consideration. This is particularly true in regard to the selec-

tion and appropriate design of melting units for specific purposes. Comparative studies of those changes of chemical elements which are generally considered as most outstanding in the efficiency of the refining period during a heat clearly indicate the influence of hearth capacity and reaction ratio upon the final quality of the produced ingot or even foundry metal.

Metallurgically speaking, deoxidation and degasification are probably the generally desirable of all reactions in the finishing of any heat of iron or steel. Both proceed markedly faster in furnaces of high reaction ratios, thereby producing a more uniform structure in the resultant metal with little or no difficulties in subsequent thermal and mechanical operations.

Bulletins of the Kaiser Wilhelm Institute

By W. TRINKS

Professor of Mechanical Engineering,
Carnegie Institute of Technology.

DURING the year 1933 a very wide range of subjects was covered by the German Institute as is evident from the 22 bulletins which constitute Volume 15 of the proceedings. There are 314 pages, 444 illustrations and 121 tables. An enormous amount of work has been accomplished, and the careful reading of the bulletins requires considerable time. The volume can either be bought in its entirety or else individual bulletins can be purchased. Of course, they are in German.

The variety of work covered is so great that little more can be done here than to mention the titles of the various bulletins. (1) Experiments on the Pressure Distribution in the Region of Contact in a Rolling Mill. (2) The Influence of Manganese on the Hardening Ability of Carbon Steels. (3) Contributions to the Acoustic Investigation of Steel Bars. (More particularly for the production of chimes.) (4) Calorimetric Investigations on the Tempering of Hardened Carbon Steel. (5-a) The Desulfurization in High Frequency Furnaces. (5-b) Design and Operation of Vacuum High Frequency Furnace. (6) On the Precise Determination of Lattice Constants by the Reflection

Method. (7) On the Mechanical Properties of Alloy Cast Iron and a New Method for Evaluation of Bending Investigations. (8-a) Tests in Rolling Carbon Steels and Silicon Steels at Medium Temperatures. (8-b) The Effect of Friction in the Rolling of Strip Steel. (9) On the Influence of Annealing Temperature on the Drawing Qualities of Steel Wire. (10) A Fatigue Test with a Tension and Compression Machine at High Frequency. (11-a) On the Distortion of Lattice Structure During Cold Flow and Its Restoration During Crystal Recovery and Recrystallization. (11-b) On Variations of the Lattice Parameter of Alpha Iron During the Absorption of Hydrogen. (12-a) Experimental Investigation of the Magnetic Roasting of Iron-Oxide Ore by Means of Iron Carbonate. (12-b) Measurement of Electrical Resistance for Determining the Kinetics of Transformation of Austenite. (14) On the Kinetics of Transformation of Austenite. Magnetic Experiment on Self-hardening Steel. (15) On the Reaction between Commercial Types of Pig Iron and Their Slag. (16) On the Preparation of Colithic and Pebble-like Iron Ore. (17) On the Aging of Steel Sheets. (18) Experiments

on Steel Bars with Variable Tensile Stress. (19) The Application of Potentiometric Analysis in Steel Work Laboratories. The Determination of Sulphur in Iron, Steel, Ferroalloys, Slags and Ores. (20) On the Kinetics of Transformation of Austenite. Magnetic Experiments on Carbon Steel Bars. (21-a) The Reactions Between Carbon-free Liquid Iron and Iron-manganese Oxide Silicates Which Are Saturated with Silica. (21-b) The Equilibrium of the Deoxidation of Liquid Iron with Manganese and Silicon. (22) Additional Experiments on the Physical Phenomena in the Thomas Process.

The work done is meritorious throughout; it contains items of great interest to metallurgists, chemists, physicists and to mechanical engineers. Some of the results are truly outstanding.

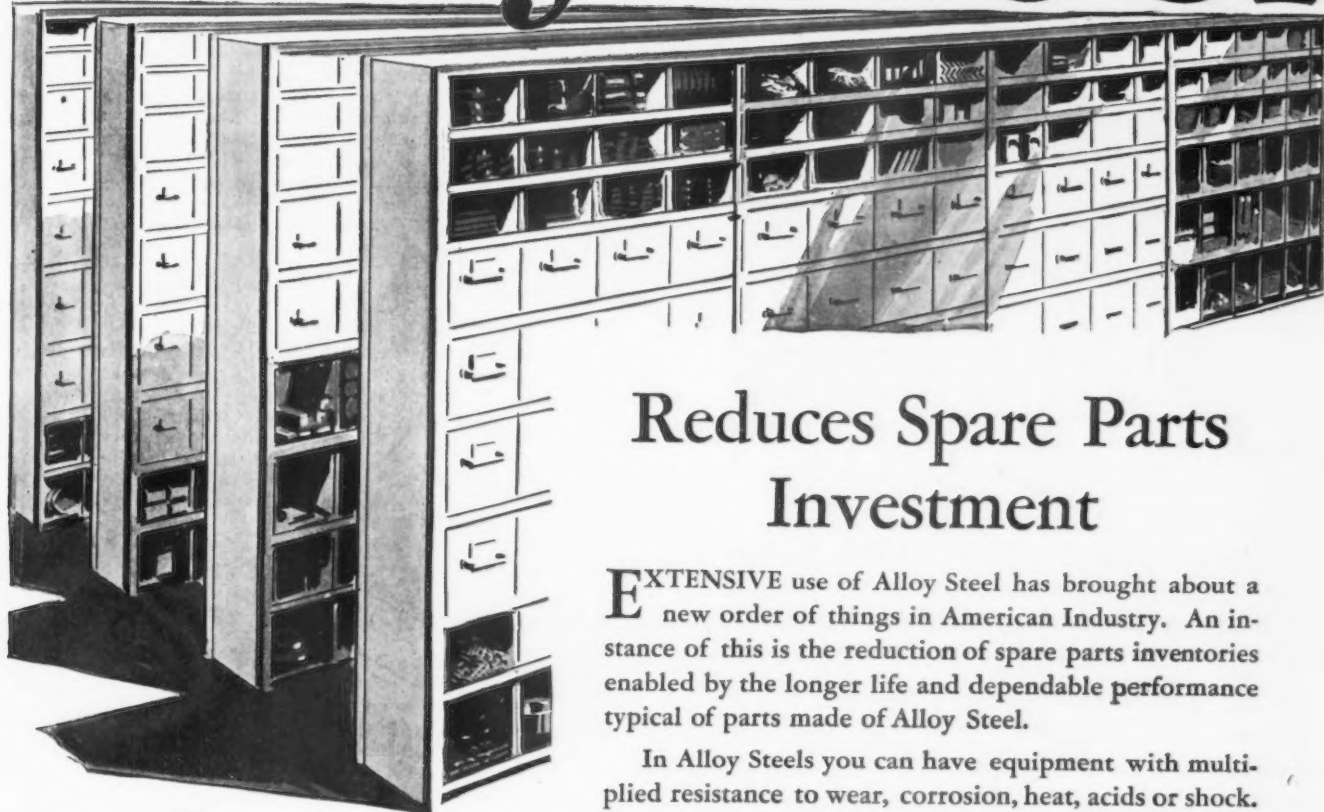
TRADE NOTES

Robins Conveying Belt Co., New York, has appointed following sales agencies: Fred Bathke, 1957 University Place, St. Paul, Minn., for Minnesota, western Wisconsin and northwestern Michigan, and Raymond Church, Box 114, Pleasant Ridge Station, Cincinnati, for southwestern Ohio, southeastern Indiana, and western Kentucky.

H. Klaff & Co., Inc., Baltimore, has purchased plant of John Illingsworth Steel Co., Philadelphia, and plans are now being made for the dismantling. Considerable raw material consisting of quantity of finished rounds and flats, rolling mill equipment and machinery is included.

MacWhyte Co., Kenosha, Wis., has moved Pittsburgh office and warehouse to 704 Second Ave., Pittsburgh. Complete stock of wire rope is carried on hand at Pittsburgh.

Alloy Steel



Reduces Spare Parts Investment

EXTENSIVE use of Alloy Steel has brought about a new order of things in American Industry. An instance of this is the reduction of spare parts inventories enabled by the longer life and dependable performance typical of parts made of Alloy Steel.

In Alloy Steels you can have equipment with multiplied resistance to wear, corrosion, heat, acids or shock. You can have equipment with superior physical properties. You can have long machine life under the most severe operating conditions.

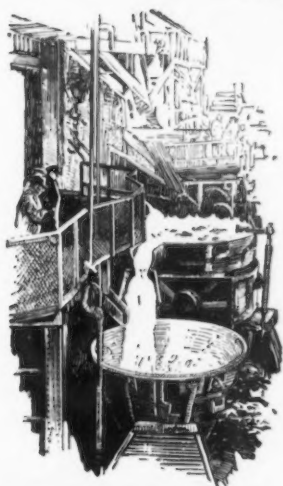
Alloy Steel assures minimum interruption of production for repairs. It should be carefully considered for any part that wears out or breaks before the equipment itself becomes obsolete. Electromet engineers will gladly explain how the above results may be obtained by the use of Ferro-Alloys in Alloy Steel.

Inquiries Invited

ELECTRO METALLURGICAL SALES CORP.

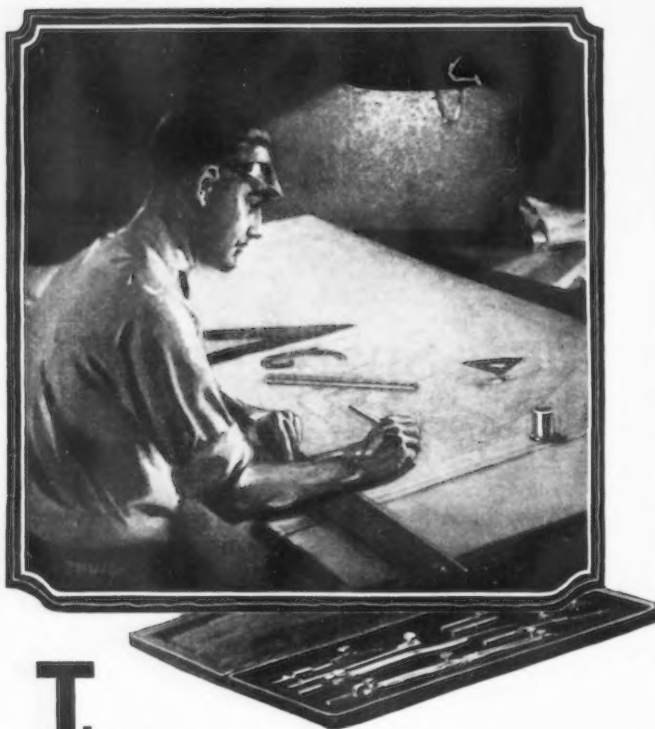
Unit of Union Carbide and Carbon Corporation

Carbide and Carbon Building, 30 East 42nd Street
New York, N. Y.



Electromet Ferro-Alloys & Metals

Helping You Solve Bearing Problems



There is dollars-and-cents value for the machinery manufacturer in the **Engineering and Metallurgical Service** which Bunting supplies without cost or obligation. We will gladly work with you or your engineers on any detail appertaining to design, alloy and application of bushings and bearings. Send us your blue prints or a statement of your requirement.

We have here for the free use of our customer patterns and tool equipment for over 30,000 designs of bushings and bearings. We carry constantly in stock hundreds of finished bushings and bearings for all machine tool and electrical applications. Leaded bronze bearings; graphited oil-less bearings; super-hard bronze bearings; bronze washers; Babbitt-lined bronze-backed bearings; and bronze castings are typical products. We make them to your specifications or help you determine the specifications or both.



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BUNTING
QUALITY
PHOSPHOR BRONZE
BUSHING BEARINGS
PATENTED

JUST BETWEEN US TWO

They Took a Crack at Us

IS there a trade paper in the land that would not be flattered to have one of its editorials singled out for attack by such an august body as the Federal Trade Commission?

If there is, it isn't us, for we feel honored that our March 22nd editorial, "Let's Examine the Price Record," sent the Commissioners into such a tantrum that they referred to it harshly in their recent philippic to the Senate.

What peeved the Commission no end was our revelation that the present-day average price of metals and metal products, compared with the 1900 to 1915 average, represents a deflation as great as that of farm products.

They accused us of trick figuring. Were we going to stand idly by and see our 80-year reputation for nothing less than complete infallibility sullied in the eyes of the country's 96 No. 1 legislators? NO-SIR-EE! So our able editor, John H. Van Deventer, put down the facts about price levels so plainly that anyone can grasp them. See "Common Sense Applied to Price Levels," pp. 13-17, Mar. 29 IRON AGE.

"Now," we asked ourselves, "will the Commission be gracious enough to pass along to the Senate this article, revealing the Commission's errors, as eagerly as it passed along the accusation?" "No," we reflected cynically, "even august Commissions are composed of frail mortals like ourselves, with a natural dislike for being found in error."

So, to be on the safe side, we sent a copy of the article to every United States Senator, and to every Congressman, too, just for good measure.

Herman Can Do No Wrong

NEUER TAG, a German newspaper, brought suit recently against the *National Zeitung*, another German newspaper, charging certain unfair competitive practices. We gather that the *Zeitung's* subscription solicitors visited readers of the *Neuer Tag* and threatened various hardships and inconveniences if a subscription were not forthcoming.

It happens that the *Zeitung* is owned by Herman Wilhelm Goering, Hitler's right-hand man. Who do you suppose won the suit, and on which newspaper did the Court feel safe to spill the vials of its wrath?

We have never seen the *Zeitung*, but our guess is that it is fat with advertising. If you were selling space on that paper, imagine how quickly you could soften up a hard prospect. "Now, Mr. Schmidt, don't make it necessary for me to report that you can't use this preferred position. You wouldn't want good, old H. W. to feel unfriendly toward you, would you? You know how he gets when he's crossed." Wotta set-up!

We hope Mr. Wirt is making mountains out of molehills.

Bird-Eggers Lay an Egg

Scribner's for April inquires:

"Who hasn't heard of Richard and Holling Lowe of Franklin, Idaho, who wrote the General Electric Company, asking to exchange their collection of birds' eggs . . . for a Frigidaire?"

Shame on Richard and Holling for proving that hundreds of thousands of dollars' worth of refrigerator advertising has failed to crease their cerebrums. Would they write Ford for a Chevrolet, Schenley for a case of Canadian Club, or Campbell for a can of Heinz beans?

He Refuses to Be Downed

"When the depression got in its nasty work on us out here it almost, if not quite, knocked me out of the picture . . . Now I find the surest way to acknowledge defeat or to become a back number is to be NOT read up on current developments of the trade and news of the plants. So I am enclosing check for renewal of my subscription."—A production executive.

Fortune is a fickle dame, but she always has a soft spot in her heart for the man who is well-informed. Which is why the wise men in the industry read this family journal religiously. Among other things, it's No. 1 in volume of information, and in our old-fashioned way, we believe that's what people buy trade papers for.

Big Blurb

We boasted recently that we would soon show a circulation gain of 1,000 over 1933's low point. We passed the thousand mark like a ship goes over the equator, without feeling the jolt, and now we're 1,200—count 'em—1,200 above the depression nadir. How're we doin'? Swell!

A. H. D.